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ABSTRACT

The Pupil-Perceived Needs Assessment (PPNA) is designed to assist school personnel in collecting information on pupil attitudes, reactions, and feelings towards new and existing curricular and extracurricular programs or towards education in general, and to assess pupils' needs from the pupils' perspective. The package is not meant to be used as an evaluation tool nor as the sole basis for planning program changes. It is recommended that PPNA be used with other data (such as pupil academic performance, and supplementary data from other groups, such as parents, teachers, or state policy makers), and that school district personnel determine the relative weight of all data collected. A questionnaire is usually recommended for use in collecting student data; time, cost, and personnel are factors to be considered in undertaking PPNA. The tasks involved in PPNA are described: developing, administering, processing, analyzing, and reporting PPNA data. Activities and instructions for developing a PPNA program are detailed. (MH)

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PUPIL-PERCEIVED NEEDS ASSESSMENT PACKAGE

Research for Better Schools, Inc.
1700 Market Street
Philadelphia, Pennsylvania 19103

October 1974

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PUPIL-PERCEIVED NEEDS ASSESSMENT PACKAGE

Developed By

Hsuan L. DeLorme
Product Developer

Michael D. Marvin
Director of Comprehensive Planning

Alan R. Harrod
Planning Systems Developer

Sanford Temkin
Director of Development

COMPREHENSIVE PLANNING COMPONENT
Michael D. Marvin, Director

ADMINISTERING FOR CHANGE PROGRAM
Richard McCann, Director
Sanford Temkin, Director of Development

RESEARCH FOR BETTER SCHOOLS, INC.
Robert G. Scanlon, Executive Director

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UNIT 1

PLANNING A PPNA PROJECT

For use by the individual responsible for coordinating a Pupil-Perceived Needs Assessment effort--the Project Manager.

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Other individuals involved in the pilot and broad-scale tests of these materials provided critical suggestions and comments which enabled us to improve this package. Their names are listed below:

Pilot Test Reviewers

School District Personnel

Walter J. Bell, Director
The Foundation School, Inc.
Orange, Connecticut

Frances Bennet, Principal
F. E. Bellows School
Mamaroneck, New York

Charles V. Bethea, Jr., Principal
Lake Park Elementary School
Lake Park, Georgia

Cecil Carlton, Superintendent
Gladys Morse Elementary School
Perry, Florida

Sister Cyrilla, Principal
St. Gregory Elementary School
Philadelphia, Pennsylvania

J. Homan, Principal
Van Sciver Elementary School
Haddon Township, New Jersey

Donald Kuhn, Principal
F. S. Barry School
Cortland, New York

Roger Messerly, Principal
Bowman Woods Elementary School
Marion, Iowa

Bernard J. Schmitt, Principal
Victor Haen Elementary School
Kaukauna, Wisconsin

J. H. Williams, Principal
Ocean City Elementary School
Ocean City, Maryland

RBS Staff Members

Marilyn Appel, Curriculum Director
Individualized Learning Program

Graynle Edwards, Director of Research
Administering for Change Program

Hurley Hanley, Field Consultant
Administering for Change Program

Alan Harrod, Planning Systems Developer
Administering for Change Program

John McAdams, Administrative Training Developer
Administering for Change Program

Eui-Do Rim, Acting Coordinator of Formative Evaluation
Individualized Learning Program
Appraisal Component

Alice Valdes, Deputy Director
Corporate Evaluation

Statistical Assessment Consultant

Chander T. Rajaratnam
Statistics Department
Wharton School
University of Pennsylvania

Broad-Scale Test Reviewers

School District Personnel

Walter J. Bell, Director
The Foundation School, Inc.
Orange, Connecticut

Charles Bethea, Principal
Lake Park Elementary School
Lake Park, Georgia

Jack Bradley, Assistant Principal
Cuba Elementary School
Cuba, New Mexico

Donald Kuhn, Principal
F. S. Barry School
Cortland, New York

James Jungers, Coordinator
Evaluation Unit
Franklin Pierce School District
Tacoma, Washington

Linda O'Neal, Teacher
Edward T. Robbins Elementary School
San Antonio, Texas

Frances Parsons, Teacher
Edward T. Robbins Elementary School
San Antonio, Texas

RBS Staff Members

Rodney Ball, Coordinator
Product Design and Development
Administering for Change Program

Edward Behrman, Evaluator
Administering for Change Program

Thomas W. Biester, Staff Associate
Administering for Change Program

Beatrice Cromwell, Administrative
Training Developer
Administering for Change Program

William Evans, Evaluator
Administering for Change Program

Gary Moore, Staff Associate
Administering for Change Program
Educational Psychology
Temple University
Philadelphia, Pennsylvania

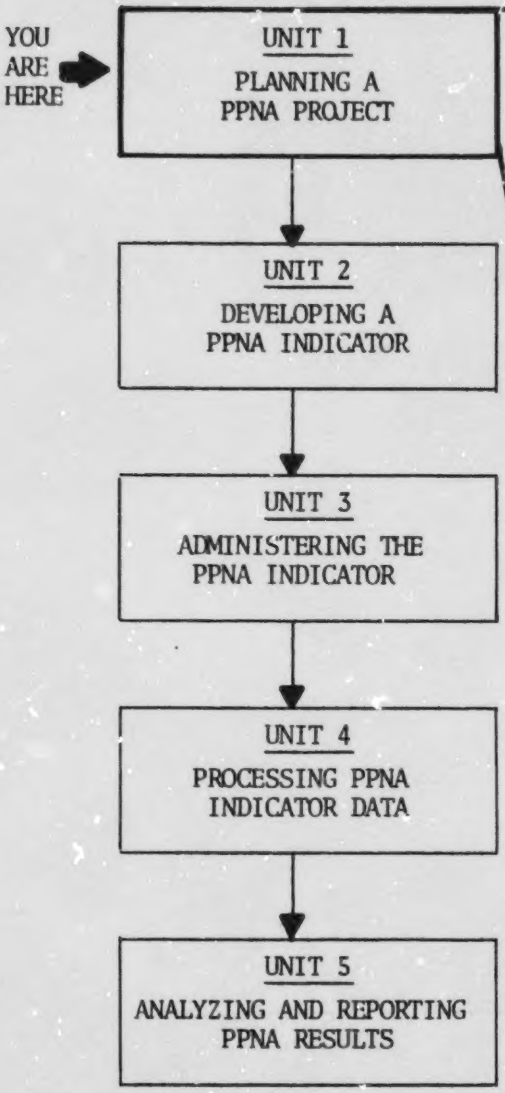
Suzanne Root, Administrative
Training Developer
Administering for Change Program

Sharon Tumulty, Administrative
Training Developer
Administering for Change Program

Independent Reviewer

Dr. Charles E. Dwyer, Professor
Graduate School of Education and
Wharton School
University of Pennsylvania
Philadelphia, Pennsylvania

SEQUENCE OF UNITS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USE OF PUPIL-PERCEIVED NEEDS ASSESSMENT PACKAGE

The Pupil-Perceived Needs Assessment Package contains an introductory tape cassette, five units, and a Supplement on sampling. The tape cassette provides a broad picture of the package; it can also be used as an introduction to the package for members of the groups responsible for specific tasks. It is strongly recommended that personnel from various levels of the school system (e.g., Assistant Superintendent, Principals, Curriculum Specialists, Teachers, Evaluators, Researchers, etc.) participate in this project.

The unit titles correspond to the five main tasks involved in this method of collecting information from pupils: Planning a PPNA Project, Developing a PPNA Indicator, Administering the PPNA Indicator, Processing PPNA Indicator Data, and Analyzing and Reporting PPNA Results. The Supplement, however, is to be used only when the sampling effort is mentioned, i.e., in this unit when sample size is determined and in Unit 4 when a final sample is selected.

The different tasks are designed to be performed by people with appropriate knowledge and experience. Since the number of people involved will vary from task to task, the number of copies needed will vary from unit to unit. For instance, one copy of Unit 1 will be needed for the Project Manager, three to six copies of Unit 2 for members of the development group, 50 copies of Unit 3 for those administering the indicator (assuming that 50 classes participate), two to five copies of Unit 4 for the group who process the data, one to six copies of Unit 5 for those involved in analyzing and reporting the results, and one or two copies of the Supplement on sampling.

Colored pages are used in this package so that the exercises and worksheets (green pages) as well as checklists and information sheets (pink pages) stand out from the main text for easy reference at later stages of the information gathering process.

PUPIL-PERCEIVED NEEDS ASSESSMENT (PPNA)

Information collection is almost always the first step to undertake in the process of planning and improving school programs. The educational process involves different groups of people, e.g., administrators, teachers, pupils, parents, citizens, State Department of Education employees, etc. Each of these groups approaches educational needs from a different perspective. Unfortunately, current school curricula and programs usually reflect only what other people--administrators, teachers, parents, etc.--consider appropriate for pupils, while the pupils' own feelings are not taken into account. This approach cripples the attempts of school system personnel to make sound decisions related to planning and improvement.

The purpose of this package is to assist school personnel in collecting information on pupil attitudes, reactions, and feelings toward existing or new programs (both curricular and extra-curricular) or toward education in general, and in assessing pupil needs from the pupils' perspective. Information on pupil-perceived needs, together with other data, will prove useful to school district personnel in making decisions related to planning and improvement. Supplementary data may include information gathered from teachers, parents, citizens, state policy-makers, etc. In a sound decision-making process, considerations such as the politics of the situation, the availability of resources, value trade-offs and alternatives, etc., should also be taken into account, although these factors are not discussed in this package.

Before school district personnel decide to use this package, it is strongly recommended that they determine the relative weight the pupil information gathered with this package should be given compared with other kinds of pupil data (e.g., pupil academic performance) and data from the other groups mentioned in the foregoing paragraphs. To make this determination, questions such as those listed below should be considered:

How much importance should be given to all pupil data?

How much importance should pupil data collected with this package be given?

How accurate are pupil perceptions?

How careful and honest are pupils in completing questionnaires?

Should we respond by giving pupils more of what they perceive as being needed, try to change their perceptions of what is needed, or ignore their perceptions unless they coincide with ours?

It should be kept in mind that this package cannot be used as an evaluation tool. It would also be dangerous to use the data collected with this package as the *sole* basis for planning program changes.

If this project is to be implemented, it is important that school administrators commit themselves to respond positively to any needs reported and to convince the pupils that their views will be taken seriously.

In addition to making the necessary commitment in terms of time, money, personnel and effort, one individual must be appointed to take full responsibility for coordinating the project. This person is referred to as the "Project Manager" in this package. To coordinate the project successfully, the Project Manager must be given the authority needed to accomplish his tasks and be provided with the time, budget, and personnel needed to do his job.

USE OF PPNA INFORMATION

Pupil-Perceived Needs Assessment information can help personnel at various levels of the school organization, depending on the situation:

- Pupil-Perceived Needs Assessment information can make the *classroom teacher* sensitive to the perceived needs of the pupils in his/her classroom.
- Pupil-Perceived Needs Assessment information can inform the *school principal* about problems which can be corrected at the building level.
- Through systematic analysis of district Pupil-Perceived Needs Assessment information, together with other data from teachers, parents, principals, community leaders, etc., *school district administrators* can develop a sound basis upon which to base decisions related to district-wide planning and improvement efforts.

Pupil-Perceived Needs Assessment can also supply:

- Baseline information regarding the reactions of pupils to ongoing programs and activities within a school. Information of this kind can be used to establish standards against which subsequent changes may be evaluated.
- Information on program strengths that can be further developed.
- Information on program weaknesses that can be corrected.

- Information on changes that are being or have been implemented in a school. Pupils' perceptions of such changes can reflect the effects of the changes on the pupils themselves. The direction that improvement efforts should take may also be indicated by this information.
- Information that helps to clarify a suspected problem, or problems, already evolving in the school district, the causes of which are unknown.
- New ideas for school activities.

METHODS TO COLLECT PPNA INFORMATION

The collection of this valuable information from students cannot be left to chance. While many pupils are willing to express their feelings about their educational experiences, information obtained through unplanned procedures is generally of little value. If expressions of pupils' feelings are to be useful, a systematic information collection approach is needed.

The methods or approaches most commonly used to obtain data from respondents are interviews and questionnaires.

Compared to an interview, a questionnaire is less expensive, is much easier to administer, and can be given to a large number of respondents simultaneously. The impersonal nature of questionnaires allows respondents to express themselves more freely, subjects them to less pressure since immediate responses are not required, and insures some degree of uniformity from one measurement situation to another. The questionnaire approach does require that respondents have a certain level of reading and/or writing ability; however, considering the school environment which the Pupil-Perceived Needs Assessment is designed to measure (from the third grade up), the questionnaire approach is more desirable than the interview approach. (With pupils who do not have third grade reading and/or writing ability, questionnaires can be administered orally. Administering questionnaires orally proved successful when this package was field tested.)

The Pupil-Perceived Needs Assessment indicator, an instrument used in Pupil-Perceived Needs Assessment, is usually a questionnaire (rating-scale, open-ended, or mixed) designed by school personnel to obtain data on pupils' feelings, attitudes, and opinions in whatever areas are of prime concern to the school/district.

Rating-scale questionnaires list statements or questions with a set of answers provided for each item or question; the respondent indicates his response by circling one of the answers supplied for each item or question. Answer scales are usually continuous in nature. For example, one scale might indicate the degree of agreement/disagreement with each of a series of statements.

Open-ended questionnaires contain questions to which the respondents supply written answers in whatever form, length, or detail they wish.

Mixed questionnaires contain both rating-scale and open-ended items.

SPECIFICATION OF ADMINISTRATIVE CONSTRAINTS

Three possible administrative constraints should be considered before a decision to implement a PPNA project can be made: these constraints involve *time*, *cost*, and *personnel*.

The *time* required for a given PPNA project can vary widely, depending on the many factors involved, e.g., (1) desired pupil sample, (2) type of PPNA indicator selected (rating-scale, open-ended, or mixed), (3) number of indicator items needed, (4) desired quality of the indicator, (5) experience of the staff involved with similar tasks, (6) method of administering the indicator (written or oral responses, pre- and post-administration, etc.), (7) urgency of the project, etc. A PPNA project does not necessarily require that school district personnel devote uninterrupted segments of time to it, i.e., whole days or whole weeks. If staff members are only available after school hours, the project can be accomplished by a cumulative effort which will take more time. If the project is to be implemented as a cumulative effort, extra time should be allowed for the various activities when the schedules or time lines are being established.

The main *cost* items in a PPNA project involve developing the indicator, reproducing it, processing pupil responses, and analyzing the data. Another likely cost item is compensation for the personnel involved, but frequently this expense can be avoided by implementing the project as an in-service training program.

Personnel availability might impose another constraint. Appropriate personnel should be involved in each project task; for instance, the people developing the PPNA indicator should be completely familiar with the curriculum or program being assessed; the people responsible for drawing the sample should have training or experience in sampling; etc. After you have identified the most appropriate people for each task, as Project Manager, you should find out when they are available so that time can be scheduled for them to perform the tasks involved.

Estimates of the time, cost, and personnel requirements for a PPNA project of moderate scope are given on the following page. These estimates are provided for each of the major tasks involved.

Consider your constraints before deciding whether you will be able to implement a PPNA project.

	TASK	TIME*	COST	PERSONNEL
1.	Developing a PPNA Indicator (includes reproducing the indicator)	4-6 hours	0 to $100	3-6 people
2.	Administering the PPNA Indicator	1 class period	no cost	Any number of people
3.	Processing PPNA Indicator Data (includes summarizing the data)	4-6 hours	0 to $200	2-5 people (computer services may be used)
4.	Analyzing and Reporting PPNA Results	4-8 hours	0 to $120	1-6 people
5.	Sampling**	4-8 hours	0 to $ 40	1-2 people

Taking your administrative constraints into consideration, have you decided to implement a PPNA project? If *yes*, continue reading. If *no*, stop here.

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*The time estimates here show the actual time needed per participant for each task; the duration of the project, however, could vary from one to ten months.

**Activities related to sampling can be carried out while the Project Manager is planning the PPNA project.

DEFINING THE PURPOSE OF THE PROJECT

In order to plan a PPNA project, it is necessary for school district personnel to first define the purpose of the project in terms of why information from pupils is needed. It might be valuable to know how pupils feel about a specific curriculum area, for example, either because pupil outcomes are low or because attendance in those classes is poor. Any qualifying considerations such as curriculum, program, grade levels (or age groups), pupil population involved, which apply should also be specified. For example, suppose that there has been an increase in classroom disturbances in a junior high school. In this case, the purpose defined for a PPNA project might be "to identify the causes of the classroom disturbances as perceived by the pupils." The pupil population involved would include all of the pupils in the school. Specifying a curriculum area would not be appropriate, since this problem cuts across all curriculum areas.

In addition to the above information, you should also specify any comparisons that are going to be made. For example: Do pupils prefer the new books to the old ones? Do open classes generate better attitudes toward school than traditional classes? Do minority pupils feel excluded from activities although other pupils do not? Some common kinds of comparisons are:

> Before-after comparisons: Comparing the scores of a group of pupils before an event with their scores after the event.
>
> Comparisons of different treatments: Comparing the scores of one group of pupils with those of another group of similar pupils receiving different (or no) instruction. (For example, comparing different Reading programs.)
>
> Comparisons between subpopulations: Comparing one subgroup of pupils with the entire group or with another subgroup. (For example, comparing black pupil attitudes to white or Chicano attitudes.)

Your project could be designed to include one or more of the kinds of comparisons outlined above.

INFORMATION SHEET 1

Indicate below the purpose of your PPNA project. In addition to detailing exactly why this information is needed, be sure that curriculum, program, grade levels (or age groups), pupil population involved, and any comparisons to be drawn are specified, if applicable.

1. Purpose of the project

2. Curriculum (and/or program)

3. Total pupil population involved

Population Breakdown

Schools	Grades (Ages)	Classes	Subtotal

4. Comparisons to be drawn

DETERMINING INDICATOR SPECIFICATIONS

As Project Manager, you need to make several decisions at this time regarding various general aspects of the indicator which, in turn, will affect both cost and time considerations. These decisions involve three different elements: the type of indicator to be used--rating-scale, open-ended, or mixed; the length of the indicator; and the method of development, i.e., whether you will use an existing instrument or develop your own indicator. These considerations will be discussed in turn.

DECIDING ON THE TYPE OF INDICATOR

The following questions have been compiled to assist you in determining whether to use an open-ended questionnaire, a rating-scale questionnaire, or a mixed questionnaire.

Check (✓) yes or no for each question in the appropriate column on the right. The meaning of each shape will be explained on the following page.

	Yes	No
1. Do you want to collect very specific information about the area of concern?	☐	○

	Yes	No
2. Do you want the pupils' responses to be minimally influenced by the way the questions are asked?	○	☐
3. Will enough qualified volunteers, teachers, or other staff members be available to score the indicators?	⧇	☐
4. Will pupils' opinions expressed by degree of likes and dislikes be sufficient for your purpose?	☐	○
5. Are the pupils' writing skills adequate for them to express themselves (at least third grade level)?	○	☐
6. Are you so limited by the time available that processing the indicators is a serious problem (a week or less)?	☐	⧇

The checks marked in the *squares* indicate a preference for the rating-scale format. The checks in the *circles* suggest using an open-ended indicator. Any responses in a *circle-inside-a-square* should be ignored, since they do not specifically relate to either form.

If neither type of questionnaire is strongly indicated, an indicator containing both rating-scale and open-ended questions may be the best kind of instrument for your project. Of course, other factors, such as availability of existing indicators, may influence your decision. (More detailed discussions of these factors are supplied in Unit 2.)

DECIDING ON THE LENGTH OF THE INDICATOR

The length of the indicator will depend on the amount of information needed to fulfill the stated purpose of your PPNA project. Also, the time required to administer the indicator should fit into a typical class period. For the lowest grade levels, the period of administration generally should not exceed 30 minutes, with no more than 20 minutes allowed for responding. Thirty or 40 minutes should provide ample time for pupils in the higher grades.

Generally, the time allowed to administer a given indicator will determine how many questions can be included. Since it takes longer to answer an open-ended question than a rating-scale question, an open-ended indicator usually contains fewer questions than a rating-scale indicator.

DECIDING ON THE METHOD OF DEVELOPMENT

The final basic decision to be considered is related to how the indicator will be developed. You may wish to use an existing instrument, modify an existing instrument, or construct an entirely new one.

You may wish to confer with one or more persons with special training or experience in this area. Some sources which provide information on existing instruments are listed in Unit 2. If you are considering the use of an existing instrument, however, be sure that it is appropriate for the grade level and program being assessed. If possible, try to develop an indicator for your PPNA project--you are most familiar with the local situation and know what kinds of information you want to collect from the pupils.

If, at this point, you are undecided as to which method to use, postpone this particular decision until you reach Unit 2, just before the actual development of the indicator. This decision does not have to be made now, although once it is made it will have a significant effect on both the final results of the project and on the cost of the project in terms of the development time required.

INFORMATION SHEET 2

INDICATOR SPECIFICATIONS

A. Type of Indicator (Rating-scale? Open-ended? Mixed?)

B. Length of Indicator (How long will it take to administer the indicator? How many items will be included?)

C. Method of Development (To use existing instrument/items? To construct your own instrument/items?)

TASKS INVOLVED IN PPNA

Having specified the administrative constraints, defined the purpose of the project, determined the type and length of the PPNA indicator, and perhaps also the desired sample size,* you need to develop an overall plan for the project. Hence, it is important at this point that, as Project Manager, you familiarize yourself with the tasks involved in the project. The five most crucial tasks are described briefly below.

(I) Planning a PPNA Project. (More specifically dealt with later in this unit.)

In performing this task the Project Manager will acquire all of the information needed to carry out preparatory activities designed to facilitate the performance of all subsequent tasks.

(II) Developing a PPNA Indicator. (More specifically dealt with in Unit 2.)

This task involves developing a Pupil-Perceived Needs Assessment indicator appropriate for collecting information on the defined area of concern. The PPNA indicator is usually developed as a joint effort by a group including teachers, curriculum specialists, and principals.

(III) Administering the PPNA Indicator. (More specifically dealt with in Unit 3.)

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*Refer to Section I of the Supplement for information designed to assist you in deciding whether or not to use a sample and, if a sample is to be used, how large it should be.

Teachers or other staff members administer the indicator to the pupils and collect the indicators at the end of the administration period.

(IV) Processing PPNA Indicator Data. (More specifically dealt with in Unit 4.)

The PPNA indicators are processed and the data collected are summarized.

(V) Analyzing and Reporting PPNA Results. (More specifically dealt with in Unit 5.)

A summary report is prepared to be submitted to the appropriate personnel and administrators for their review.

In the following section, specific activities or subtasks are listed under each of the five tasks mentioned above to give you an idea of the overall process. This outline will be a helpful reference throughout the assessment process.

Task I - Planning a PPNA Project

A. Information needed by the Project Manager

1. What is the purpose of the project?
2. How large is the total pupil population involved?
3. How much time is needed for indicator development, reproduction, packaging, administration, processing, and reporting?
4. How large a budget is needed for this project?
5. How many participants are needed for the group which will develop the indicator?

6. What information is needed about personnel who could appropriately develop and/or administer the indicator (subject matter, grade/level, etc.)?

B. Activities for the Project Manager

1. Determine sample size. (See the detailed information on sampling provided in Section I of the Supplement.)
2. Develop a tentative task schedule and time flow for the project.
3. Estimate costs for the project.
4. Establish a group to develop an indicator, if necessary.
5. Arrange for the location, time, and facilities for group meetings.
6. Arrange for pilot testing and revision of the indicator during the development phase.
7. Arrange for printing, packaging, storing, and distributing the indicators.
8. Arrange time, place, and procedures for administering the indicator.

Task II - Developing a PPNA Indicator

A. Actual development of the indicator

If a *group effort* is planned, the group members should discuss the development task with the Project Manager.

1. The Project Manager assigns specific responsibilities to group members.
2. The Project Manager distributes supplies and resource materials for use in the development effort.

3. The group decides whether to use an existing indicator or to develop their own.

4. The group develops prototype questions, an answer sheet, and necessary instructions.

5. The group audits the prototype questions.

6. The questions are typed out and proofread. (Time for replying to each question, sequence of questions, spacing between questions, etc., are considered.)

B. Pilot testing the indicators

The indicator is reproduced for pilot testing on a small group of pupils who are not members of the sample group. It is suggested that an evaluation sheet be attached to the indicator or that provision be made for oral feedback so that these pupils can comment on the indicator to help the developers determine how useful it is in terms of achieving its purpose.

C. Revision of the indicator on the basis of pilot test results, if necessary. If revisions are extensive, the revised indicator may have to be pilot tested.

D. Reproduction of the revised indicator for administration to the population or sample to be tested.

Task III - Administering the PPNA Indicator

A. Each participating teacher should receive sufficient copies of the PPNA indicator for his class before the scheduled administration time.

B. The teachers should read the directions for giving the indicators before administering them. If they have any questions, they should ask the Project Manager.

C. The teachers should make sure that every pupil has an indicator and a pencil and understands how to respond, where to enter his responses, etc.

D. The teachers should be available to answer any pupil questions during the administration period.

E. The teachers should collect all completed indicators from the pupils at the end of the administration period.

F. All completed indicators should be delivered to the Project Manager for processing as soon as possible. Unused indicators should also be returned to the Project Manager.

Task IV - Processing PPNA Indicator Data

A. Clear, step-by-step instructions on how to sample, code, tally, or categorize the data should be provided to the people who are to process the data.

B. The Project Manager should supervise the processing of the indicator data.

C. The processed data should be reported in a format which will be understandable to any selected audience(s).

Task V - Analyzing and Reporting PPNA Results

A. Having received the results, teachers and/or other appropriate personnel analyze the results and prepare a report on the area of concern involved.

The foregoing section provides a rather detailed outline indicating what the project involves and what activities you, as Project Manager, should anticipate. In the remaining sections of this unit two critical activities are discussed which you will have to perform in connection with Task I; (a) developing a tentative task schedule and time flow for the project and (b) preparing a project-related cost estimate.

TASK SCHEDULE AND TIME FLOW

Three examples are provided on the following pages to show some possible formats for presenting a task schedule together with a time flow. Example 1 (page 1-25) shows the five major tasks, indicates the personnel responsible for each task, and provides an estimate of the actual time required for each task. Examples 2 and 3 (pages 1-26 and 1-27) present the project tasks in terms of two time flows using different units of time (one is given in weeks and the other in days). A time flow makes it possible not only to set milestones for specific tasks but also to envision the total time required for the project by showing how the time estimates for each task relate to other ongoing programs or activities.

EXAMPLE 1

TENTATIVE TASK SCHEDULE FOR A PUPIL-PERCEIVED NEEDS ASSESSMENT PROJECT

TASK	RESPONSIBLE PERSONNEL	TIME ESTIMATE*
I. Planning a PPNA Project	Project Manager	1 day
II. Developing a PPNA Indicator	1. Project Manager 2. Development group 3. Printing unit	2 days
III. Administering the PPNA Indicator	1. Project Manager 2. Participating teachers	1-2 class periods
IV. Processing PPNA Indicator Data	1. Project Manager 2. Data-processing personnel/agency	3-5 days
V. Analyzing and Reporting PPNA Results	1. Project Manager 2. Participating teachers	1 day

*The time estimated for each task is an average based on experience with local school districts. The time required for each task can vary greatly, depending on the scope of the project.

EXAMPLE 2

SAMPLE TIME FLOW FOR PUPIL-PERCEIVED NEEDS ASSESSMENT TASKS

(BY WEEK)

TIME AVAILABLE: 10 WEEKS

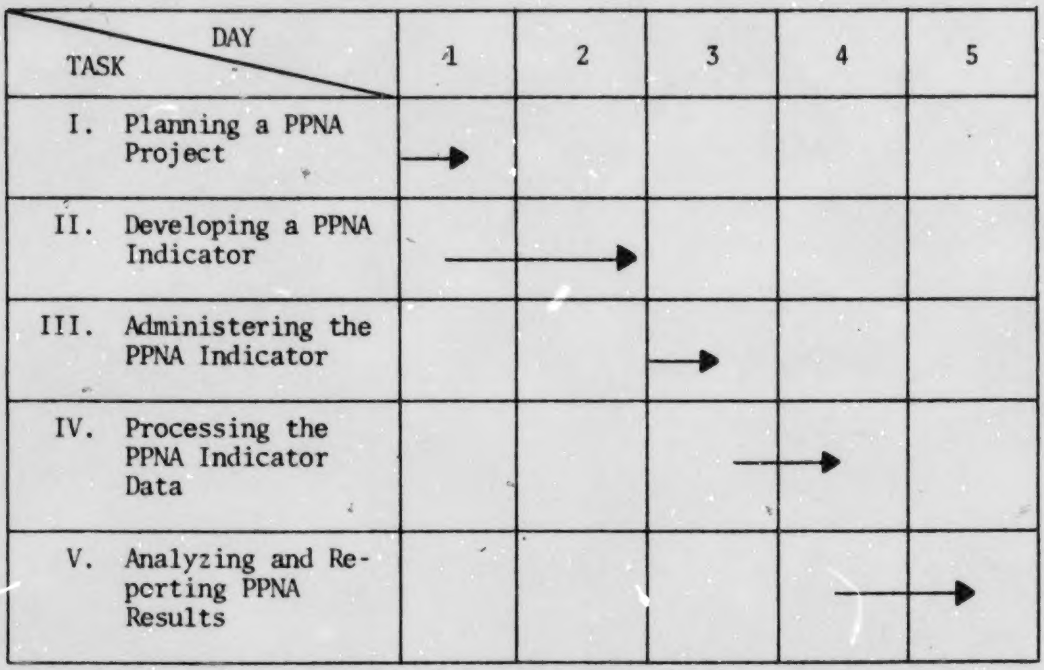
WEEK TASK	1	2	3	4	5	6	7	8	9	10
I. Planning a PPNA Project	—	→								
II. Developing a PPNA Indicator (includes pilot testing)			—	→						
III. Administering the PPNA Indicator				—	→					
IV. Processing the PPNA Indicator Data					—	—	—	—	→	
V. Analyzing and Reporting PPNA Results										→

EXAMPLE 3

SAMPLE TIME FLOW FOR PUPIL-PERCEIVED NEEDS ASSESSMENT TASKS*

(BY DAY)

TIME AVAILABLE: ONE WEEK



TASK \ DAY	1	2	3	4	5
I. Planning a PPNA Project	→				
II. Developing a PPNA Indicator	→	→			
III. Administering the PPNA Indicator			→		
IV. Processing the PPNA Indicator Data			→	→	
V. Analyzing and Reporting PPNA Results				→	→

*The time required for completing a given PPNA project will vary drastically depending on the scope of the project. The diagram above illustrates an extremely limited project where only four and a half days are needed. This could be a situation where an 8th grade Algebra teacher wants to collect feedback on a new teaching method. In a case like this, the teacher can actually handle every task himself to collect the information desired.

WORKSHEET 1

In order to develop a realistic task schedule and time flow, ask yourself the following questions:

1. Have starting and ending dates been specified for the project?
2. How long will it take to:
    a. develop an indicator?
    b. reproduce the indicator?
    c. pilot test and revise the indicator?
    d. administer the indicator?
    e. process the indicator data?
    f. analyze and report the results?
3. When will the staff be available?
4. Do vacations, holidays, or other school-related functions extend the period of time needed to implement the project?

* * *

Use the worksheets on the following two pages to develop a tentative task schedule and time flow for your project.

The description for each task listed on pages 1-20 to 1-23 and the sample task schedules and time flows presented on pages 1-25 to 1-27 should help you in establishing time lines for your project.

WORKSHEET 1A

Task Schedule

WORKSHEET 1B

Time Flow

Now that tentative time lines for performing the tasks involved in the project have been developed, you are better able to develop a more sophisticated cost estimate on the basis of the various expenses involved in implementation. This section gives you an opportunity to develop a cost estimate for the project, taking budgetary constraints into consideration.

If costs are not a problem, turn to page 1-43 for a summary of this unit.

PREPARING A COST ESTIMATE

The expenses related to a PPNA project may or may not involve new or additional costs in terms of the district budget. This will depend on the size of the operation and how the project relates to overall school system activities. If the project only covers a small area of the district or has become one of the regular activities of the school system, the costs will probably be covered as regular school expenses (e.g., teachers do not require additional compensation for their participation; a printing machine is available to reproduce the indicator at no extra cost; paper, pencils, and other materials can be supplied from existing school stocks; secretarial services are available; etc.); in a case like this, a project will require practically no additional budget. On the other hand, if a project involves a large staff, requires large quantities of materials and supplies, and outside clerks are needed to score indicators, etc., a special budget will have to be set up for the project. In either case, decisions about the scope of a project will have to be made by the central office administrators.

When a project involves new expenses for a district, an estimate of total costs should be prepared. As Project Manager, it is your responsibility to estimate such costs by category for each task.

The categories to consider include costs related to personnel, materials and supplies, reproduction, data processing, and any other expenses involved.

Suggested procedures for estimating expenses by cost category are discussed below:

PERSONNEL

Personnel costs are the most expensive budget item in any assessment project. Participating personnel include the Project Manager, principals, curriculum specialists, teachers, typists, scoring staff, etc. The cost estimate for this item will depend on the scope of the project as well as on the duration and the nature of personnel involvement. If a project is limited in extent, it is probable that no separate budget will be needed; teachers or interested parents could volunteer to perform the essential tasks without any extra expense being incurred. In other situations, when a project does involve expenses over and above the regular budget, estimates of hourly or daily pay for the personnel involved are essential.

The following formula is suggested for estimating personnel costs:

Estimated Average Hourly Rate	X	Estimated Number of Hours	X	Estimated Number of Staff	=	Estimated Personnel Costs

This information should be calculated for each task.

MATERIALS AND SUPPLIES

This cost item covers any books, stationery, typing supplies, etc., that may be required for the project. It should *not* include costs for reproducing the indicators, as this item is handled separately. For most districts, however, no costs will be incurred in this category, since the materials needed will be negligible in terms of normal district supply requirements.

REPRODUCTION

You will need the following information in order to estimate the cost of reproducing a Pupil-Perceived Needs Assessment indicator:

1. A rough estimate of the total number of pages involved. This figure can be calculated using the following formula.

Number of Pupils Involved X Number of Pages for Indicators

+ Number of People Administering Indicator X Number of Pages of Instructions

Estimated Total Number of Pages

2. A rough estimate of the costs related to different printing processes. The diagram on the next page provides brief evaluations of four reproduction processes in terms of availability in the school district, cost (approximate cost for 1000 copies of one page), and speed.* All estimates are based on the experience of Research for Better Schools, Inc.

   It is suggested, however, that each school district collect its own cost information on various printing methods, how costs are calculated, etc. Since a rough estimate of the total number of pages needed can be figured out, district personnel will be able to determine the most cost-effective method for printing their indicator once cost estimates for the various methods are available.

---

*The diagram on page 1-36 will only be meaningful in schools/ districts where more than one process is available.

A COMPARISON OF FOUR ALTERNATIVE REPRODUCTION PROCESSES

METHOD OF REPRODUCTION	AVAILABILITY IN SCHOOL DISTRICTS	COST FACTORS*	APPROXIMATE COST FOR 1000 COPIES OF ONE PAGE**	SPEED
1. Ditto	Most available method	A. Requires a machine to prepare master. B. Paper costs approximately $1.40 per ream. C. Ditto Master 15¢	$2.10	Slow and messy
2. Mimeograph	Second in availability	A. Master stencil may be prepared by typist but not all masters can be typed. In these instances a machine can cut the stencil. Cost of stencil is 20¢ but labor costs could be high. B. Paper costs approximately $1.25 per ream.	$2.70 + labor costs	2500 sheets per hour
3. Xerox	Less frequently available	A. Varies depending on model. One estimate is 6¢ per page.	$60.00	Depends on model
4. Multilith-offset	Generally available only in large districts	A. Masters cost around 6¢ each. B. Paper around $1.60 per ream. C. Print shops may charge about: 6¢ per page for 100 copies 5¢ per page for 250 copies 4¢ per page for 1000 copies	$3.26	6000-8000 sheets per hour

*All costs depend on the size of the job and often on the number of jobs. Discounts are available from print shops for large jobs.

**All processes involve labor costs but stencil preparation can be quite expensive.

DATA PROCESSING

After the indicators have been administered, they are collected for processing. Different techniques are available for processing data. Critical factors like time, space to accommodate working staff (if manual processing is considered), costs, confidentiality of data, objectivity of evaluators, and scope of operations (the number of participants, number of indicators to be processed, etc.) all will affect the decision on which data processing technique to use.

The data from both rating-scale and open-ended indicators can be processed manually or by computer; however, cost-effectiveness should be considered when making this decision. Since personal judgment will be an element in processing open-ended items, the objectivity of the evaluators, inter-evaluator reliability, and the number of evaluators needed must be considered.

OTHER

This item is included to cover any special costs such as mailing for data collection which might not have been anticipated.

EXERCISE 1

COST ESTIMATE

The thirteen statements listed below relate to possible cost items involved in a Pupil-Perceived Needs Assessment project. Fill in the blanks following each statement with the appropriate task and cost (see outline of tasks on page 1-19 to 1-20) category or categories (see page 1-33 for the cost categories involved).

1. Three teachers volunteer to spend 3 hours after school to develop an indicator.

   Task(s)__________________________
   Category_________________________
   (or categories)__________________

2. A teachers' conference room has been reserved for use during indicator development as well as for scoring and tallying the indicator data.

   Task(s)__________________________
   Category_________________________
   (or categories)__________________

3. All of the teachers are so occupied with their work that the district has to hire consultants from a nearby university to develop an indicator.

   Task(s)__________________________
   Category_________________________
   (or categories)__________________

4. A contract has been signed between the school district and a computer data processing company for the processing of indicator data.

   Task(s)__________________________
   Category_________________________
   (or categories)__________________

5. The Project Manager estimated the costs for the PPNA project and contacted school personnel to participate in the project.

Task(s)____________________
Category____________________
(or categories)______________

6. It was decided to draw a sample of 3 classes from each grade (3-12) for administering the PPNA indicator

Task(s)____________________
Category____________________
(or categories)______________

7. Four conscientious senior high school students volunteered to score the indicators of the elementary school pupils on History.

Task(s)____________________
Category____________________
(or categories)______________

8. As a result of a parent-teacher meeting, parent representatives are eager to see the results of the PPNA project and request copies of the summary report.

Task(s)____________________
Category____________________
(or categories)______________

9. A task force of teachers is so interested in the project that they want to administer the indicator on a pre- and post-test basis.

Task(s)____________________
Category____________________
(or categories)______________

10. The first draft of the indicator is pilot tested by 10 students.

Task(s)____________________
Category____________________
(or categories)______________

11. Each participating staff member is asked to give a copy of his schedule to the Project Manager so that he can prepare a working agenda for the project.

Task(s)____________________
Category____________________
(or categories)______________

12. A teachers' guide is prepared to give the teachers who will administer the indicators instructions on carrying out this task properly.

Task(s)____________________
Category____________________
(or categories)______________

13. The History curriculum coordinator was given the responsibility of coordinating the entire PPNA project.

Task(s)____________________
Category____________________
(or categories)______________

* * *

Which of the above statements might not involve actual costs for the district?

ANSWERS TO EXERCISE 1

1. Task II Category Personnel
2. Task II, IV Category Other
3. Task II Category Personnel
4. Task IV Category Data processing
5. Task I Category Personnel
6. Task I Category Personnel
7. Task IV Category Personnel
8. Task V Category Reproduction (reports)
9. Task II, III Category Materials and reproduction (II), Personnel (III)
10. Task II Category Reproduction
11. Task I Category Personnel
12. Task II Category Personnel, materials & supplies
13. Task I, II, III, IV, V Category Personnel

* * *

Only statements 3 and 4 involve actual cost items for the school district; the other statements refer to activities which may be cost-free.

INFORMATION SHEET 3

COST ESTIMATE

Identify and estimate the costs for all cost categories for each task of *your* Pupil-Perceived Needs Assessment project.

Cost Categories	Estimated Cost	
TASK I - PLANNING A PPNA PROJECT		
Personnel		
Materials and supplies		
Other		
Sub-Total (I)		
TASK II - DEVELOPING A PPNA INDICATOR		
Personnel		
Materials and supplies		
Reproduction (pilot test and test)		
Other		
Sub-Total (II)		
TASK III - ADMINISTERING THE PPNA INDICATOR		
Personnel		
Materials and supplies		
Other		
Sub-Total (III)		
TASK IV - PROCESSING PPNA INDICATOR DATA		
Personnel		
Materials and supplies		
Computer data processing agency		
Other		
Sub-Total (IV)		
TASK V - ANALYZING AND REPORTING PPNA RESULTS		
Personnel		
Materials and supplies		
Reproduction (reports)		
Other		
Sub-Total (V)		
Sum of Sub-Totals Above		
Sum of Five Sub-Totals x 10%*		
TOTAL		

*The total estimated cost should allow for any unforeseen expenses; increasing the sum of the sub-totals by 10% is a common method used to adjust an estimated budget to cover any unanticipated expenses.

SUMMARY

This unit was designed to help you, as Project Manager, develop some very basic information about your PPNA project, such as time, cost, and personnel constraints, the purpose of the project, the pupil population involved, comparisons to be drawn, specifications for your PPNA indicator, task schedule and time flow, and information on estimating costs. All of this information will assist you in coordinating the tasks involved in your project.

The last section of this unit supplies both a preparation checklist and a completion checklist for each of the following units in this package (Tasks II to V) to help you ascertain the completeness and quality of your project. As Project Manager you will find these checklists very helpful.

PREPARATION CHECKLIST

Unit 2: Developing a PPNA Indicator

Listed below are some selected questions (not a complete list) which will help you to prepare for the development activities outlined in Unit 2.

It is suggested that you make sure that all of this information has been developed *before* you turn to Unit 2.

___ 1. According to the schedule you established, how much time do you have for the development of an indicator?

___ 2. When should you start the development task?

___ 3. Does the task require a group effort? If *yes*, continue. If *no*, go to item 6 below.

___ 4. Do you have a list of the names and telephone numbers of the people who will be participating in the development task?

___ 5. Where is the group going to meet? And when?

___ 6. Are sufficient supplies, stationery, and reference materials available for the indicator development effort?

___ 7. What did you decide about having the indicator reproduced? Have you talked to the printer or other individual responsible for the job?

___ 8. Reminders and notes regarding above:

When all of this information has been developed, go on to Unit 2.

COMPLETION CHECKLIST

Unit 2: Developing a PPNA Indicator

The following selected questions provide a checklist to help you assess the development of your PPNA indicator.

If you find any task which was *not* performed, it is suggested that it be completed before you continue.

___ 1. Was the indicator prepared in the desired format (i.e., open-ended, rating-scale, or mixed)? If there was a change in the format, what was the reason for it?

___ 2. Were instructions developed for the personnel who are going to administer the indicator?

___ 3. Was the indicator completed within the designated time schedule? If not, does the time schedule for the project have to be re-adjusted?

___ 4. Was the indicator revised after pilot testing?

___ 5. How many copies of the indicator and the instructions for administering it are needed? Are the indicators ready to be administered?

___ 6. Reminders and notes regarding above:

When all of the above tasks have been completed, continue reading.

PREPARATION CHECKLIST

Unit 3: Administering the PPNA Indicator

The following list will help you examine the preparations that are needed to ensure success in administering the indicator.

It is suggested that all of these preparations be made *before* you turn to Unit 3.

___ 1. What date has been selected for administering the indicator? To which classes will it be administered? During which class period(s)?

___ 2. Prepare sufficient copies of the indicator to be administered. (Be sure to have extra copies made to cover loss, damage, or a low estimate of the number of pupils involved.)

___ 3. Distribute indicators by classroom to the participating teachers *before* the time designated to administer them.

___ 4. At the same time, distribute copies of the instructions for administering the indicators to the participating teachers and ask them to read them immediately; be prepared to answer any questions that they may have on administering the indicator.

___ 5. Reminders and notes regarding above:

When all of these preparations have been made, go on to Unit 3.

COMPLETION CHECKLIST

Unit 3: Administering the PPNA Indicator

The following selected questions provide a checklist to help you assess the steps taken to ensure success in administering the indicator.

If you find any task which was *not* performed, it is suggessted that it be completed before you continue.

___ 1. Did every teacher receive sufficient copies of the indicator at the designated time?

___ 2. Was the indicator administered at the designated time?

___ 3. Did you collect all of the completed and unused indicators from all participating classrooms?

___ 4. Reminders and notes regarding above:

When all of the above questions have been answered, continue reading.

PREPARATION CHECKLIST

Unit 4: Processing PPNA Indicator Data

The following list will help you examine the preparations that are needed to ensure success in processing the indicator data.

It is suggested that all of these preparations be made *before* you turn to Unit 4.

___ 1. Have arrangements been made for processing the data?

___ 2. Do the personnel who are going to process the data have the following abilities?

  ___ Can they follow written instructions?

  ___ Are they able to work in a group setting?

  ___ Are they logical and systematic?

  ___ Are they able to write readable summary reports for the appropriate recipients?

___ 3. Have they agreed to work under the terms specified regarding time, place, compensation, etc.?

___ 4. Have you written a set of instructions on how to process the type of indicators used for the data processing group?

___ 5. Will you be available to supervise the processing of the data?

___ 6. Reminders and notes regarding above:

When all of these preparations have been made, go on to Unit 4.

COMPLETION CHECKLIST

Unit 4: Processing PPNA Indicator Data

The following selected questions provide a checklist to help you assess the steps taken to ensure success in processing the indicator data.

If you find any task which was *not* performed, it is suggested that it be completed before your continue.

___ 1. Was analysis of the data double-checked to avoid any statistical errors?

___ 2. Was the task completed within the designated period of time? If not, do you have to readjust the time schedule for the project?

___ 3. Have all the papers relating to data processing been returned to you, i.e., all indicators, intermediate coding or tallying sheets, and summary report(s)?

___ 4. Reminders and notes regarding above:

When all of the above tasks have been completed, continue reading.

PREPARATION CHECKLIST

Unit 5: Analyzing and Reporting PPNA Results

Have decisions been made about:

___ 1. Who should analyze the data and prepare the report?

  ___ classroom teachers?

  ___ building principals?

  ___ outside consultants?

  ___ central office administrators?

___ 2. When the report should be submitted to you?

___ 3. Reminders and notes regarding above:

When all of these decisions have been made, go on to Unit 5.

COMPLETION CHECKLIST

Unit 5: Analyzing and Reporting PPNA Results

The following selected questions provide a checklist to help you assess the steps taken to ensure success in analyzing and reporting the results.

If you find any task which was *not* performed, it is suggested that it be completed at this time.

___ 1. Have the data been analyzed?

___ 2. Was a summary report prepared?

___ 3. Has information been channeled to the appropriate group(s) of people?

  ___ teachers?

  ___ principals?

  ___ pupils?

  ___ community?

  ___ central office administrators?

___ 4. Have recommendations based on the report been developed?

___ 5. Reminders and notes regarding above:

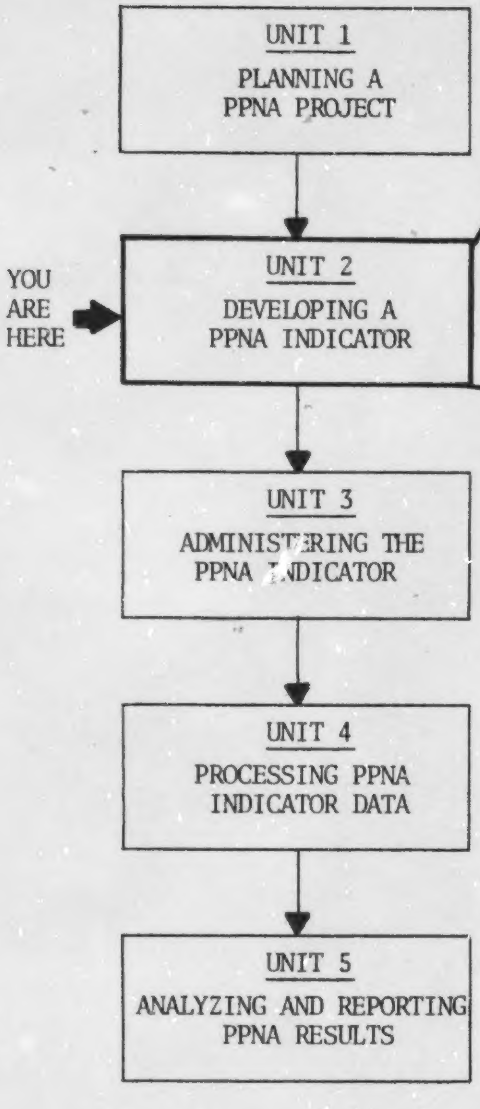
When all of the above tasks have been performed, your Pupil-Perceived Needs Assessment effort has been completed.

UNIT 2

DEVELOPING A PPNA INDICATOR

For use by the Project Manager and
the group responsible for developing
a PPNA indicator.

SEQUENCE OF UNITS


UNIT 1
PLANNING A PPNA PROJECT
YOU ARE HERE
UNIT 2
DEVELOPING A PPNA INDICATOR
UNIT 3
ADMINISTERING THE PPNA INDICATOR
UNIT 4
PROCESSING PPNA INDICATOR DATA
UNIT 5
ANALYZING AND REPORTING PPNA RESULTS

CONTENT OF UNIT 2

What is a Pupil-Perceived Needs Assessment (PPNA) Indicator?...............2-1
Validity and Reliability...2-5
Decision on Mode of Development..............2-7
How to Modify an Existing Rating-Scale Instrument..2-13
How to Construct a Rating-Scale Indicator..........2-16
How to Construct an Open-Ended Indicator..........2-23

WHAT IS A PUPIL-PERCEIVED NEEDS ASSESSMENT (PPNA) INDICATOR?

Development group members who have not read Unit 1 of this package will need to know, as they approach the task of indicator development, what a Pupil-Perceived Needs Assessment (PPNA) indicator is. The PPNA indicator is usually a questionnaire designed by school personnel to obtain data on pupils' feelings, attitudes and opinions on school in general or on a particular curriculum or program. The PPNA indicator *is not* a "test." The term "indicator" was chosen because the responses given are supposed to reflect (i.e., indicate) what pupils perceive as needs in the program (or curriculum) being studied.

Before your group starts to develop a PPNA indicator, the Project Manager should discuss with you all of the preliminary decisions covered in Unit 1. These planning decisions include information on: (1) the purpose of the project (i.e., why the project is being undertaken), specifying the program or curriculum and pupils involved, and any comparisons to be drawn, and (2) preliminary specifications for the PPNA indicator (i.e., preferred type of indicator, length of indicator, pupil sample size, etc.).

A PPNA indicator is usually a questionnaire. The kinds of questions used will depend on whether the indicator is to be a rating-scale, an open-ended or a mixed questionnaire.

A rating-scale questionnaire lists statements or questions with a set of answers provided for each item or question; the respondent indicates his response by circling one of the answers supplied for each item or question.

An open-ended questionnaire contains questions to which the respondents supply written answers in whatever form, length, or detail they wish.

A mixed questionnaire contains both open-ended and rating-scale items.

Sample questions illustrating the three types of questionnaires are provided on the following pages.

SAMPLE RATING-SCALE INDICATOR QUESTIONS

Eighth Grade Social Studies

1. I think, generally, most of the projects we have had in this course are: (Circle the appropriate number.)

	Not At All	Somewhat	Very
a. Time-consuming	1	2	3
b. Difficult	1	2	3
c. Meaningless	1	2	3
d. Ineffective	1	2	3

2. I think we should have spent more time discussing: (Please check no more than three topics.)

_____a. Economics
_____b. Family Relationships
_____c. Government and Citizenship
_____d. Human Behavior
_____e. Labor Relations
_____f. Media Influence
_____g. Modern Society
_____h. Political Leadership
_____i. Religion
_____j. World History

SAMPLE OPEN-ENDED INDICATOR QUESTIONS

Eighth Grade Social Studies

1. What is the most interesting project you have had in Social Studies this year?
2. How different from last year is this year's Social Studies course? Try to compare the two courses.
3. Given total freedom, what kinds of projects do you prefer in this course?
4. Which particular topic in Social Studies have you learned most about? Why?
5. Do you have any suggestions for improving this course?
6. What is your overall feeling about this course? (Check one.)

___Excellent ___Good ___Acceptable ___Fair ___Poor

SAMPLE MIXED INDICATOR QUESTIONS

Eighth Grade Social Studies

1. I think, generally, most of the projects we have had in this course are: (Circle the appropriate number.)

	Not At All	Somewhat	Very
a. Time-consuming	1	2	3
b. Difficult	1	2	3
c. Irrelevant	1	2	3
d. Ineffective	1	2	3
e. Poorly-designed	1	2	3
f. Childish	1	2	3
g. Dull	1	2	3

2. Describe the interactions you have had with other kids in the course. Do you think they have any effect on the success or failure of the projects?

VALIDITY AND RELIABILITY

Two critical concepts should be considered when developing an indicator. They are validity and reliability.

> *Validity* indicates the degree to which an instrument actually measures what it is supposed to measure. The validity of a Pupil-Perceived Needs Assessment indicator would depend upon the degree to which the indicator can supply information related to the purpose of the project.
>
> *Reliability* indicates the consistency of results obtained with a given instrument. If reliable, an instrument can be used over and over again in unchanging or highly similar situations and will produce the same or very similar results. In this sense, a rating-scale indicator is apt to be more reliable than an open-ended indicator. Reliability, however, is not as significant as validity in the case of an open-ended indicator, since it is designed to collect relatively subjective information from the pupils.

Consider, for example, a PPNA project recently implemented in a California school district. The purpose of the study was to determine the attitudes of elementary pupils toward Social Studies. After testing several pupils in the third and fourth grades, the teachers reported that most pupils did not understand the meaning of the term "social studies." Therefore, one would certainly question whether the study really could measure attitudes toward Social Studies! Under the circumstances reported, many of the items included in the questionnaire being considered for use in this project had little (low) validity.

Can an indicator have reliability but lack validity? Yes. If the same questionnaire is administered a second time to the same pupils under similar conditions (i.e., no instruction on Social Studies in the interim), it might well yield similar results. The instrument obviously measures something, and it may measure it consistently. When an indicator is *unreliable*, however, a second study under similar conditions will not necessarily yield similar results.

Another example is provided by the experience of two elementary teachers in a Texas school who designed a PPNA indicator to determine how their pupils felt about an IPI (Individualized Prescribed Instruction) Mathematics program. In the indicator, however, they included many self-concept items that had nothing to do with the IPI Mathematics program. Thus, many of the questions in the indicator they developed lacked validity because they provided very limited information on what the teachers really wanted to know.

DECISION ON MODE OF DEVELOPMENT

As members of the PPNA indicator development group, you can take one of two approaches in developing a PPNA indicator. You can either *select* an existing pupil survey instrument or *construct* an instrument.*

Since very few open-ended questionnaires have been tested and are ready for use, we strongly encourage those who want to use an open-ended instrument to construct their own indicator.

If your development group decides to take this approach, please turn to page 2-23 for instructions on constructing an open-ended indicator.

If a rating-scale questionnaire is to be used, refer to the sources listed on the next three pages. If you decide to use an existing instrument, however, it is important that you (1) check the preliminary criteria of the instrument very carefully in terms of intent, specific objectives, target pupil population, language level, validity, reliability, availability, etc. and (2) modify the existing instrument so that it is directly related to the purpose of your project.

---

*When considering these approaches, it is suggested that group members consult with the Project Manager who, in studying Unit 1 (Planning a PPNA Project), has covered information on a number of factors which might influence this decision.

If you have not decided whether to select an existing rating-scale instrument or to construct your own indicator, continue reading.

Before your group decides whether to select or construct a PPNA rating-scale indicator, you may wish to consult the list of possible sources for existing instruments which is given below. Sources are organized in two sections: Section A includes books or educational research institutes where collections of instruments measuring pupil attitudes are available; Section B lists ten specific instruments designed to collect information on pupil attitudes, needs, and opinions. Since nine of these ten instruments can be obtained from the ERIC system (Educational Resources Information Center), their ERIC code numbers are also indicated. The sources indicated are by no means exhaustive. Pupil survey instruments from other sources can also be used, provided they are suitable for your PPNA project.

POSSIBLE SOURCES FOR EXISTING INSTRUMENTS TO COLLECT INFORMATION ON PUPIL NEEDS

A. Books and Educational Research Institutes

1. Battelle Memorial Institute, Columbus, Ohio.
2. Beatty, Walcott H., ed. (Inventory prepared by Donald J. Dowd and Sarah C. West.) Improving Educational Assessment and An Inventory of Measures of Affective Behavior. Washington, D. C.: Association for Supervision and Curriculum Development, National Education Association, 1969.

3. Rosen, Pamela. ed. ETS Test Collection. Princeton: Educational Testing Service, June, 1973.

4. Instructional Objectives Exchange (IOX): Attitude Toward School, Kindergarten-Grade 12. Revised Edition. Los Angeles: Instructional Objectives Exchange, 1972.

B. Specific Pupil Needs Instruments

1. Background and Attitude Questionnaire Items and a Priori Weights. Table 4. Princeton, N. J.: ERIC Document Reproduction Service, ED 072 090, 1972.

2. Cincinnati Public Schools: Student Survey, 1972-73. Board of Education of the City School, District of the City of Cincinnati, Ohio 45202. Copies of this instrument are available upon request.

3. Gable, Robert K., and Roberts, Arthur D. The Development of An Instrument to Measure Attitudes Toward School Subjects. ERIC Document Reproduction Service, ED 079 326.

4. Kenny, James, et al. How Students See Teachers. ERIC Document Reproduction Service, ED 077 921.

5. Kunkel, Richard C., et al. Questionnaire Items Soliciting School Related Alienation from 10,000 Senior High Pupils. New Orleans, La.: ERIC Document Reproduction Service, ED 074 093, 1973.

6. Miller, Douglas R. School-Related Attitudes of Inner-City Junior High Students. New Orleans, La.: ERIC Document Reproduction Service, ED 076 723, 1973.

7. Reid, Marilyn J. An Evaluation of City School, 1971-72. Research Report. British Columbia: ERIC Document Reproduction Service, ED 074 119, 1972.
   Student Questionnaire, ED 074 120.
   School Sentiment Index, Intermediate Level, Appendix A, ED 074 122.
   School Sentiment Index, Secondary Level, Appendix B, ED 074 123.

8. Smith, William F., Comp., et al. Jefferson Parish Schools Needs Assessment Survey. Appendix A and Appendix B. Gretna, La.: ERIC Document Reproduction Service, ED 079 367, 1972.

9. Warriner, Helen. Student Attitudes Toward Foreign Language Study--Results of a Survey. Richmond, Va.: ERIC Document Reproduction Service, ED 072 682, 1972.

10. Wood, Lynn T. A Study of Student Attitudes Towards Foreign Languages in Public Secondary Schools of Utah. Appendices. Salt Lake City, Utah: ERIC Document Reproduction Service, ED 073 711, 1972.

At this point, you may wish to take some time to locate one or more of the sources listed above in order to determine whether or not an instrument is available which would be suitable for use as your PPNA indicator.

EXERCISE 1

DECISION ON WHETHER TO CONSTRUCT OR SELECT A RATING-SCALE INDICATOR

Keeping your own project in mind, answer the following questions by checking "yes" or "no" for each question and then indicating whether you feel it would be preferable to select or construct an indicator. This information will enable you to decide whether to select or construct your indicator.

			Preferable to:	
	Yes	No	Select	Construct
1. Are there any usable and effective questionnaires available for your project?	☐	☐	☐	☐
2. Will developing an indicator require special staff training?	☐	☐	☐	☐
3. Does your district want to use this opportunity to develop a school district capability for future indicator construction?	☐	☐	☐	☐
4. Do you anticipate any difficulty in involving eligible staff members?	☐	☐	☐	☐
5. Do you have enough time to construct an indicator?	☐	☐	☐	☐
6. Would it cost more to construct items?	☐	☐	☐	☐

If you have decided to use an existing rating-scale instrument, turn to the following page for guidelines on modifying such an instrument.

If you have decided to construct a rating-scale indicator, turn to page 2-16.

If you are unable to decide whether to select or construct a rating-scale instrument, consult both the guidelines for modifying an existing instrument which begin on the following page and the guidelines for constructing a rating-scale indicator on page 2-16; then make your decision.

HOW TO MODIFY AN EXISTING RATING-SCALE INSTRUMENT

1. If you have located an existing instrument which can be modified for your project, be sure to get permission from the author or the publisher to use it.
2. It is desirable to start with as much congruence as possible between the existing instrument under consideration and the information requirements of your project.
3. Given the statement above, it still may be necessary to rewrite items in the existing instrument to improve congruence.
4. If necessary, write additional items to ensure that your information requirements are met.
5. Make any necessary changes in the items so that the wording corresponds to the vocabulary competencies of the pupils to whom the indicator will be administered.
6. As a group, select the items to be included in your PPNA indicator. The length of the indicator will depend on how much time you allow the pupils to answer it. Also, decide in what order the questions should be arranged.
7. Edit all items to eliminate ambiguities and increase explicitness; any compound items should be deleted.
8. Allow space at the end of the indicator or at the end of particular sections where the pupils can provide additional comments. These are frequently enlightening in their own right and may supply important information for use in subsequent revisions of the indicator. This is especially important when the indicator is being pilot tested.

9. Insure the anonymity of pupil responses.

10. Develop an answer sheet for the pupils, if necessary.

11. If necessary, rewrite the instructions for the people who are going to administer the indicator and for the pupils to whom it will be administered, keeping in mind their age, language level, and ability to express themselves. The instructions for those administering the indicator should include information on how to administer the indicator, how long it will take the pupils to complete it, what they are supposed to do before, while, and after administering the indicator, etc.

12. If you intend to have the data processed by computer, ask one of the computer staff to help you set up the answer sheet format to faciliate key punching.

13. Pilot test the modified instrument to verify that the items are adequate, unambiguous, and appropriately worded and that the instructions are clear. To pilot test the indicator, it is administered to a small group of pupils who, while not members of the sample group, are similar in age and ability. After the indicator is administered to these pupils, they can be interviewed individually to uncover defects in the instrument or they can be requested to supply written comments concerning the indicator.

14. Revise the indicator in accordance with the findings of the pilot test. If extensive revisions are required, it may be a good idea to pilot test the revised version.

WORKSHEET 1

Following the guidelines which begin on page 2-13:

1. Modify an existing rating-scale instrument for your PPNA project.
2. Develop an answer sheet for the pupils, if necessary.
3. Prepare instructions for the pupils to whom the indicator will be administered.
4. Prepare instructions for the people who are going to administer the indicator.
5. Pilot test and revise the indicator and the instructions.

Turn to page 2-33.

HOW TO CONSTRUCT A RATING-SCALE INDICATOR

On a rating-scale questionnaire, pupils usually are asked to give their opinions or perceptions in response to specific statements or questions by selecting from a series of possible answers the answer that most closely expresses how they feel. The number of possible replies supplied may run from a dichotomy to a five-point or even seven-point scale, depending on what the developers of the questionnaire consider both appropriate and sufficiently explicit.

The sample questions provided below serve two purposes: (1) they show you how varied the questions asked on a PPNA indicator can be and (2) they provide an inventory of response choices that may be helpful in constructing a rating-scale indicator for your PPNA project.

I. Dichotomous Responses

Yes	Agree	True
No	Disagree	False

Sample Questions

	Yes	No
1. Do you enjoy field trips?	☐	☐
2. Do you need more help from your teachers?	☐	☐
3. Do you worry about your school work?	☐	☐

	Agree	Disagree
1. Teachers care about me.	☐	☐
2. I get praise at home for good schoolwork.	☐	☐

(The above examples are from the Cincinnati Public Schools, Student Survey, 1972-73.)

II. Three-Point Scale Responses

Yes	Agree	More
No	Disagree	Less
Don't Know	Don't Know	The Same

Sample Questions

	More	Less	The Same
1. Do you do more or less reading than is required by your schoolwork?	☐	☐	☐
2. Do you think you participate in extracurricular activities more or less than the other students in your class?	☐	☐	☐
3. Would you like to have more or less help from your teacher?	☐	☐	☐
4. Would you like to have more or less contact with your teacher?	☐	☐	☐

III. Four-Point Scale Responses

Strongly Agree	Frequently	Very Important	Very Difficult
Agree	Sometimes	Important	Difficult
Disagree	Rarely	Unimportant	Easy
Strongly Disagree	Never	Very Unimportant	Very Easy

Sample Questions

For each statement, indicate the extent to which you agree or disagree by circling the appropriate letter on the answer sheet:

(A) if you strongly agree
(B) if you agree
(C) if you disagree
(D) if you strongly disagree

1. This school is run like a prison. A B C D
2. If I did something wrong at school, I know I would get a second chance. A B C D
3. Students have enough voice in determining how this school is run. A B C D
4. I like to talk to my teachers after class. A B C D
5. School is a good place for making friends. A B C D

(The above examples are from *School Sentiment Index: Secondary Level*, Instructional Objectives Exchange, 1970, Box 24095, Los Angeles, California 90024.)

IV. Five-Point Scale Responses

A Great Deal	Excellent	Very Important	Always
More Than Average	Good	Important	Often
Some	Acceptable	Fairly Important	Sometimes
Less Than Average	Fair	Fairly Unimportant	Rarely
None	Poor	Unimportant	Never

Sample Questions

To what extent do you think student ideas can influence:

	A Great Deal	More Than Average	Some	Less Than Average	None
a. what goes on in class	☐	☐	☐	☐	☐
b. field trips	☐	☐	☐	☐	☐
c. free time	☐	☐	☐	☐	☐
d. career projects	☐	☐	☐	☐	☐
e. language arts projects	☐	☐	☐	☐	☐
f. homework	☐	☐	☐	☐	☐
g. class grouping	☐	☐	☐	☐	☐
h. furniture arrangement	☐	☐	☐	☐	☐
i. behavior courses	☐	☐	☐	☐	☐
j. elective courses available	☐	☐	☐	☐	☐

(The above example is from the High School PPNA Indicator, The Foundation School, Orange, Connecticut, 1973.)

GUIDELINES FOR CONSTRUCTING A RATING-SCALE INDICATOR

1. Refine the purpose of the project, if necessary. Make sure that the purpose is clearly understood by all members of the development group.

2. List a few topics related to the purpose of the project. These topics should be dimensions or factors related to the information you are seeking and should enable you to formulate questions in such a way that pupil responses will supply the information you need. This can be done in a group brainstorming session.

3. Determine which of the topics listed would be most meaningful to the pupils involved. Consider, for example, whether the pupils have been exposed to a program long enough to have perceptions about it which they can communicate.

4. Develop rating-scale items. (This is the most critical task in the development process.)

   a. Each group member develops one item for each of the topics selected and is able to explain in detail why he feels those questions should be included.

   b. As a group, all members review the items developed and carefully select the items most closely related to the purpose of the project. Item selection should be accomplished through candid discussions in which ideas are shared.

   c. Refine each item selected through group discussion.

5. As a group, decide in what order the items should be arranged. The length of the indicator will depend on the time you allow the pupils to answer it.

6. Edit all items to eliminate ambiguities and increase explicitness; any compound items should be deleted.

7. Allow space at the end of the indicator or at the end of particular sections where the pupils can provide additional comments. These are frequently enlightening in their own right and may supply important information for use in subsequent revisions of the indicator. This is especially important when the indicator is being pilot tested.

8. Insure the anonymity of pupil responses.

9. Develop an answer sheet for the pupils, if necessary.

10. Write instructions for the pupils to whom the indicator will be administered, keeping in mind their age, language level, and ability to express themselves.

11. Write instructions for the people who are going to administer the indicator. The instructions should include information on how to administer the indicator, how long it will take the pupils to complete it, what they are supposed to do before, while, and after administering the indicator, etc.

12. If you intend to have the data processed by computer, ask one of the computer staff to help you set up the answer sheet format to facilitate key punching.

13. Pilot test the indicator to verify that the items are adequate, unambiguous, and appropriately worded and that the instructions are clear. To pilot test the indicator, it is administered to a small group of pupils who, while not members of the sample group, are similar in age and ability. After the indicator is administered to these pupils, they can be interviewed individually to uncover defects in the indicator or they can be requested to supply written comments concerning the indicator.

14. Revise the indicator in accordance with the findings of the pilot test. If extensive revisions are required, it may be a good idea to pilot test the revised version.

WORKSHEET 2

Following the guidelines which begin on page 2-20:

1. Construct a rating-scale indicator.
2. Develop an answer sheet for the pupils, if necessary.
3. Prepare instructions for the pupils to whom the indicator will be administered.
4. Prepare instructions for the people who are going to administer the indicator.
5. Pilot test and revise the indicator and the instructions.

Turn to page 2-33.

HOW TO CONSTRUCT AN OPEN-ENDED INDICATOR

The most distinguishing characteristic of open-ended questions is that they do not provide or suggest any structure for the respondent's reply. Therefore, pupils are given complete freedom to respond in their own terms using their own frame of reference. Such responses provide valuable, first-hand information which, in turn, gives teachers and administrators a more accurate idea of pupils' perceptions of whatever is being investigated.

The following guidelines should be helpful if you are going to construct an open-ended indicator:

1. Refine the purpose of the project, if necessary.

   The purpose of the project was defined in Unit 1. This definition should specify why the project is being undertaken and should include information on the curriculum or program and pupils involved and any comparisons to be drawn. The project purpose should be clearly understood by all members of the development group.

   Now, turn to page 2-29 and complete Worksheet 3.

2. List a few topics related to the purpose of the project.

   These topics should be dimensions or factors related to the information you are seeking and should enable you to formulate questions in such a way that pupil responses will supply the information you need. This can be done in a group brainstorming session.

Some sample topics related to pupils' perceptions of a Social Studies program would be: (1) learning environment in Social Studies, (2) materials used in Social Studies, (3) homework, and (4) Social Studies-related activities.

Now, turn to page 2-30 and complete Worksheet 4.

3. Develop several open-ended questions for each of the topics selected and explain in detail *why* you feel those questions should be included.

   There are three ways in which open-ended questions can be structured:

   a. Questions can be asked in an objective way. This kind of question tends to elicit a broader range of pupil responses.

      Sample Question: "What is a school for?"

   b. Questions can be asked in a subjective way. Here, the question is designed to elicit a very personal response from the pupil.

      Sample Question: "Why do you come to school?"

   c. Questions can be incompletely phrased, so that the pupil can complete them in his own words.

      Sample Question: "I come to school to ...."

4. For each topic selected, decide whether several questions or a single question should be developed.

5. Make sure the questions are appropriately worded, keeping in mind the pupils' ages, language level, and ability to express themselves.

   a. The wording should provide pupils with complete freedom in their responses.

b. The questions should be presented in a neutral way, so that neither positive nor negative answers are encouraged.

c. Avoid the use of questions which can be easily answered by "Yes," "No," or "Don't Know."

d. To lessen the likelihood that answers will be uninformative, instruct the pupils to write at least one paragraph on each question. For students in the higher grades, more elaborate answers can be requested to meet your information requirements.

e. Make the questions as simple, clear, and brief as possible. Avoid compound questions.

f. The questions should be directly related to the grade or maturity level of the pupils involved.

g. Be sure that any terms used in the questions are familiar to the pupils and consistent with what is being taught in class.

h. Make sure that every question has a number and that the questions are numbered consecutively. Unnumbered questions complicate rostering and data analysis procedures.

The sample open-ended questions below were developed to cover several topics selected for use in a project designed to collect information on a Social Studies curriculum:

Topic 1. Learning environment in Social Studies.

Sample Question: *"Compared to last year's course, this year's Social Studies program is...."*

Topic 2. Materials used in Social Studies.

Sample Question: *"To me, the lessons in our Social Studies textbooks are ...."*

Topic 3. Homework.

Sample Question: *"Our Social Studies homework is...."*

Topic 4. Social Studies-related activities.

Sample Question: *"How do you feel about activities like role-playing government officers in your Social Studies course?"*

Now, turn to page 2-31 and complete Worksheet 5.

6. At the end of the indicator, *always* provide space for the pupils to express their overall feeling about whatever your project concerns. For instance, ask: What is your overall feeling about Social Studies? (Check one.)

   ___Excellent ___Good ___Acceptable

   ___Fair ___Poor

   This information will be very helpful when the open-ended responses are being processed. (See Unit 4 for more detail on processing the collected data.)

7. a. Considerations related to indicator presentation:

   (1) Insure the anonymity of pupil responses.

   (2) Write instructions for the pupils to whom the indicator will be administered, keeping in

mind their age, language level, and ability to express themselves.

(3) Provide adequate space for answering each open-ended question.

(4) Allow space at the end of the indicator or at the end of particular sections where pupils can provide additional comments. These are frequently enlightening in their own right and may supply important information for use in subsequent revisions of the indicator. This is especially important when the indicator is being pilot tested.

b. Considerations related to other tasks:

(1) Write instructions for the people who are going to administer the indicator. The instructions should include information on how to administer the indicator, how long it will take the pupils to complete it, what they are supposed to do before, while, and after administering the indicator, etc.

(2) Refine the key response categories you have listed by re-examining them.

8. Pilot testing

Pilot test the indicator to verify that the items are adequate, unambiguous, and appropriately worded and that the instructions are clear. To pilot test the indicator, it is administered to a small group of pupils who, while not members of the sample group, are similar in age and ability. After the indicator is administered to these pupils, they can be interviewed individually to uncover defects in the indicator or they can be requested to supply written comments concerning the indicator.

When pilot testing the indicator, you will also find out approximately how much time the pupils need to complete it, and how many questions can be included. Be certain to allow enough time for all of the pupils to complete the indicator. The more conscientious pupils may take longer than others, and data from them are obviously valuable.

9. Revise the indicator in accordance with the findings of the pilot test. If extensive revisions are required, it may be a good idea to pilot test the revised version.

Now, turn to page 2-32 and complete Worksheet 6.

WORKSHEET 3

Keeping the guidelines in mind, undertake the following activities:

1. As a group, discuss the purpose of the project with the Project Manager.

2. Record here complete information on the purpose of your project, as refined during group discussions. Include information on the curriculum or program, the pupils involved, and the comparisons to be drawn.

After completing this worksheet, return to guideline 2 on page 2-23.

WORKSHEET 4

Keeping the guidelines in mind, undertake the following activities:

1. As an individual, list a few topics that you personally think are most closely related to the pupose of the project.
2. Discuss with other group members the topics they have listed.
3. As a group, select the topics most closely related to the purpose of the project.

After completing this worksheet, return to guideline 3 on page 2-24.

WORKSHEET 5

Keeping the guidelines in mind, undertake the following activities:

1. As an individual, each group member should generate at least *one* open-ended question for each topic selected. Each question should be accompanied by an explanation of how it relates to the topic.

2. Collect all the questions developed by group members and as a group discuss which ones are most relevant to the topics selected. One class period is usually allowed for administering the indicator. Keeping this in mind, decide how many questions can be included in your indicator.

3. For each question selected, list probable pupil responses by key category. This will save time later when the data are being processed. (This is discussed in more detail in Unit 4 in the section on *categorizing pupil responses*.)

After completing this worksheet, return to guideline 6 on page 2-26.

WORKSHEET 6

Keeping the guidelines in mind, undertake the following activities:

1. Arrange the questions selected in a clean, clear form. Be sure to include a question at the end of the indicator regarding the pupil's overall feeling (e.g., about Social Studies or whatever is being studied in your project). Provide a five-point scale for responses (Excellent, Good, Acceptable, Fair, Poor).
2. Prepare instructions for the pupils to whom the indicator will be administered.
3. Prepare instructions for the people who are going to administer the indicator.
4. Keep a record by key category of probable pupil responses to each question for use in processing indicator data (Unit 4).
5. Pilot test and revise the indicator and the instructions.

Now, turn to the following page and complete the Final Checklist.

FINAL CHECKLIST

Completing this checklist will enable you to make sure that all developmental activities have been undertaken.

A. For *mixed* indicators:

___1. Have you combined rating-scale items and open-ended items for pilot testing?

B. For *all* indicators:

___2. Have you pilot tested the indicator?

___3. Have you gathered written or oral comments from the pilot test pupils?

___4. Have you prepared answer sheets for the pupils, if necessary?

___5. Have you prepared instructions for the pupils as well as for the people who are going to administer the indicator?

___6. Have you revised the indicator and the instructions after pilot testing?

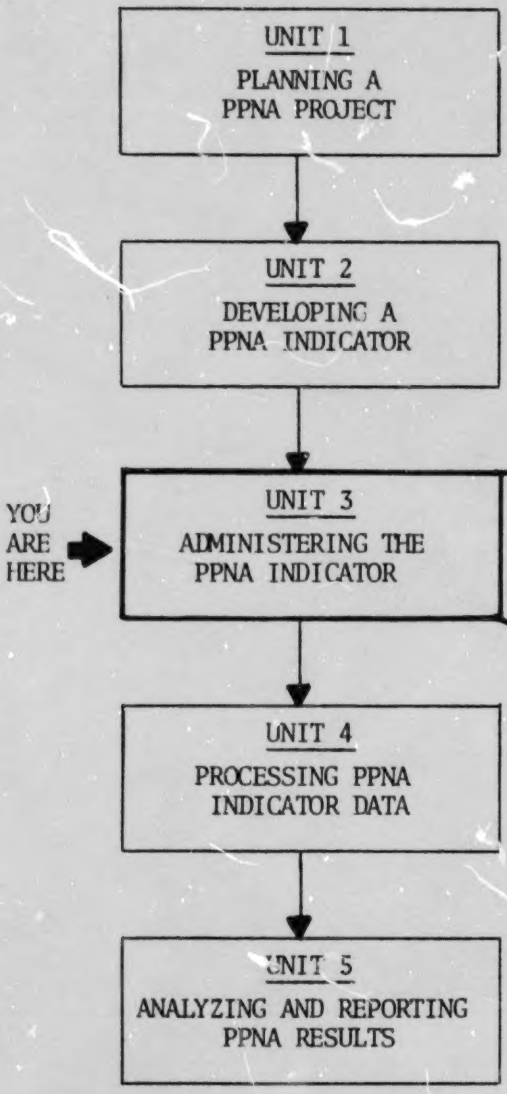
The completion of the tasks outlined above marks the end of your developmental effort. Now, return the revised indicator to the Project Manager.

UNIT 3

ADMINISTERING THE PPNA INDICATOR

For use by the people responsible for administering the Pupil-Perceived Needs Assessment indicator.

SEQUENCE OF UNITS


UNIT 1
PLANNING A PPNA PROJECT
UNIT 2
DEVELOPING A PPNA INDICATOR
YOU ARE HERE
UNIT 3
ADMINISTERING THE PPNA INDICATOR
UNIT 4
PROCESSING PPNA INDICATOR DATA
UNIT 5
ANALYZING AND REPORTING PPNA RESULTS

CONTENT OF UNIT 3

Purpose of This Unit.........3-1
What is Pupil-Perceived Needs Assessment?..........3-1
How to Administer the Indicator.....................3-3

PURPOSE OF THIS UNIT

The purpose of this unit is to provide the people who are going to administer the Pupil-Perceived Needs Assessment indicator with guidelines designed to help them accomplish this task both efficiently and according to the instructions supplied by the development group.

To administer the indicator properly, you will need information on the purpose of this Pupil-Perceived Needs Assessment project, your role in the project, and the indicator itself. You will need to familiarize yourself with the procedures for administering the indicator and with the content of the indicator, in case the pupils have questions about any of the items included.

WHAT IS PUPIL-PERCEIVED NEEDS ASSESSMENT?

In order to furnish you with some background information on Pupil-Perceived Needs Assessment, we will discuss the subject briefly, in terms of the topics outlined below:

1. Purpose of Pupil-Perceived Needs Assessment.
2. Possible uses of Pupil-Perceived Needs Assessment data.
3. The Pupil-Perceived Needs Assessment (PPNA) indicator.

The *purpose* of Pupil-Perceived Needs Assessment is to collect information on pupil attitudes, reactions, and feelings toward existing or new programs (both curricular and extracurricular) or toward education in general, and to assess pupil needs from the pupils' perspective. Information on pupil-perceived needs, together with other data collected from teachers, parents, citizens, state policy-makers, etc., will prove useful to school district personnel in making decisions related to planning, making changes, identifying problems, implementing new programs, or strengthening effective programs.

Possible *uses* of the data could be:

1. To make the *classroom teacher* sensitive to the perceived needs of the pupils in his/her classroom.
2. To inform the *school principal* about problems which can be corrected at the building level.
3. To encourage the *district planning staff* to address expressed needs through improved planning for curriculum or other programs.

Your role is to administer the PPNA indicator. What does that mean? It means that you are responsible for giving the PPNA indicator to pupils (this task is discussed on the following page in more detail), so that information from pupils can be collected and processed.

The *PPNA indicator* you are going to administer was developed by a development group made up of school personnel familiar with the curriculum area being assessed. Usually, the indicator is in a form which requires written responses. Instructions for the pupils are provided on the indicator, although they may have to be explained to pupils in the lower grades. With pupils who do not have the verbal ability to give written answers, the indicator will have to be administered orally.

HOW TO ADMINISTER THE INDICATOR

Suggested procedures for administering the indicator are outlined below:

Before Administering the Indicator:

1. After receiving your package of indicators, make sure that you have an indicator for each pupil in your class plus a few extra copies.
2. It is important that you familiarize yourself with the indicator. By reading it through, you will be able to anticipate some of the kinds of questions that the pupils might ask.

While Administering the Indicator:

1. Be sure to make some introductory comments which cover the following points:

a. If pupils' names are not to be given (to enable them to answer freely), this should be mentioned.

b. Pupils should read the instructions carefully before answering.

c. Tell the pupils that you are willing to explain any instructions or any indicator items which they do not understand.

d. Advise the pupils that they will not be graded on the indicator but that it is important for them to answer the questions honestly and fully.

e. Explain to the pupils that their comments and responses will provide important information which the school system can use in making decisions and planning improvements.

f. Urge the pupils to answer every item in the indicator.

g. If the questions are open-ended, request detailed answers (at least one paragraph for each answer).

h. Encourage the pupils to add any written suggestions or comments they want to make on the indicator.

2. Administer the indicator as scheduled, making sure that each pupil has a pencil or pen.

3. Do not monitor the pupils in such a way that you can tell how they are answering the questions.

After Administering the Indicator:

1. Collect all of the indicators and place them in an envelope on which your name and class are indicated.

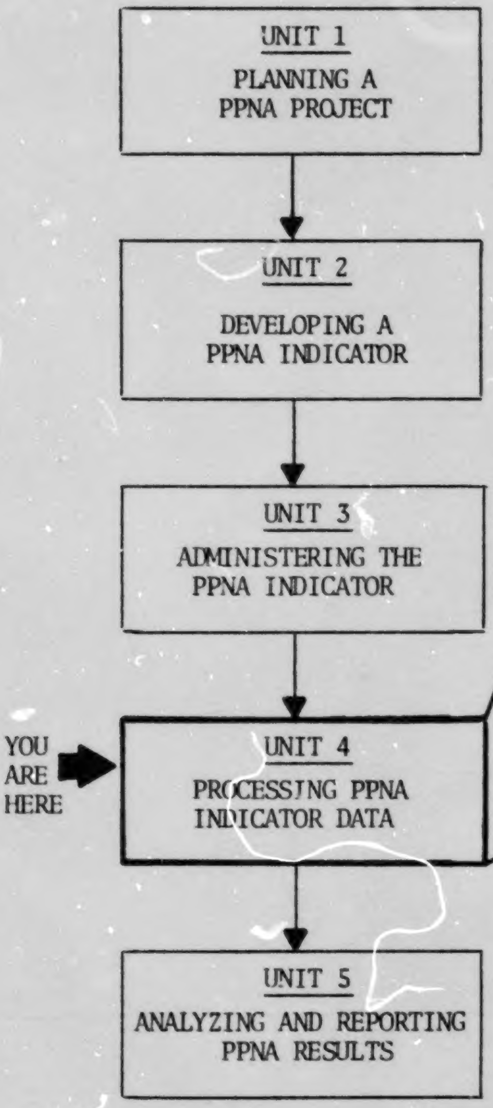
2. Return the completed indicators to the Project Manager.

UNIT 4

PROCESSING PPNA INDICATOR DATA

For use by the people responsible for processing PPNA indicator data.

SEQUENCE OF UNITS


UNIT 1
PLANNING A PPNA PROJECT
UNIT 2
DEVELOPING A PPNA INDICATOR
UNIT 3
ADMINISTERING THE PPNA INDICATOR
YOU ARE HERE
UNIT 4
PROCESSING PPNA INDICATOR DATA
UNIT 5
ANALYZING AND REPORTING PPNA RESULTS

CONTENT OF UNIT 4

Coding the Indicators..... 4-1
Sampling................. 4-1
Processing Open-ended Indicator Data.......... 4-2
Processing Rating-scale Indicator Data.......... 4-16
Summarizing the Data...... 4-21

CODING THE INDICATORS

After the indicators have been collected, all of them should be given code numbers which could be indicated in the upper right-hand corner of each indicator. Consecutive numbers should be assigned to the indicators from each class.

SAMPLING

After the indicators have been coded, the group responsible for processing the data should decide whether all the indicators administered are to be processed or only a certain percentage of them. If all of the indicators are *not* going to be processed, the Project Manager should make sure that a proper sample is drawn for processing. Instructions on drawing a sample can be found in Section II of the Supplement--Sampling, if you need assistance in drawing a representative sample.

After the two tasks mentioned above have been completed, you should be ready to process the indicator data.

For instructions on processing open-ended indicator data, continue reading.

For instructions on processing rating-scale indicator data, turn to page 4-16.

PROCESSING OPEN-ENDED INDICATOR DATA

The procedures for processing data from open-ended indicators are more involved than those for processing rating-scale indicator data, because the free responses given by the pupils must be converted into meaningful categories for analysis before they can be tabulated and summarized. The following list covers the four tasks involved. Each will be further explained as you continue reading.

I. Recording Overall Pupil Attitudes

This procedure simply involves recording the pupils' overall attitudes toward the program under assessment as indicated on the indicators by the pupils themselves.

II. Categorization

This procedure involves determining the topics or categories into which pupil responses will be grouped for further analysis.

III. Tabulation

In performing this task, pupil responses are tallied and entered in the appropriate categories determined above.

IV. Summarization

The tallies are totaled for relevant groups, the appropriate figures are calculated, and a summary statement outlining the significant characteristics of the data is written.

RECORDING OVERALL PUPIL ATTITUDES

In Unit 2 (Developing a PPNA Indicator), it was suggested that each pupil be asked to indicate his overall attitude toward the program being assessed with an open-ended indicator, i.e., what is your overall feeling about this course (or whatever is being assessed in this project)? (Check one.)

___Excellent ___Good ___Acceptable ___Fair ___Poor

When recording these overall ratings, symbols like ++, +, 0, -, -- can be used to represent the five responses given above: "++" can be used for "Excellent," "+" for "Good," "0" for "Acceptable," "-" for "Fair," and "--" for "Poor."

A sample form for recording overall pupil attitudes is provided on the following page.

Sample: The form below shows how overall pupil attitudes might be recorded.

Class: A Number of Indicators Sampled: 9

Indicator Code Number	Overall Attitude				
	++	+	0	-	--
03			✓		
08		✓			
09					✓
12		✓			
13				✓	
17		✓			
18	✓				
21		✓			
27		✓			

WORKSHEET FOR RECORDING OVERALL PUPIL ATTITUDES

On this sheet, record overall pupil attitudes using the symbols ++, +, 0, -, -- for Excellent, Good, Acceptable, Fair, and Poor respectively. Record this information for *each* class. Insert blank sheets of paper here, if more pages are needed.

Class: ___ Number of Indicators Sampled: ___

Indicator Code Number	Overall Attitude				
	++	+	0	-	--

CATEGORIZING PUPIL RESPONSES

Purpose

To determine which key categories are mentioned most frequently in pupil responses.

Procedures

A. Having read each indicator sampled, each group member submits a list of frequently appearing comments to the group leader.

B. The lists are combined, then the comments most frequently made are abstracted.

C. The comments should be separated into categories. The most frequently mentioned comments may form as many separate categories.

Some Guidelines for Categorization

1. The categories established should not be restricted to those used in the examples given here.
2. The categories used do not have to be equally global in extent; one frequently mentioned comment may form an independent category or several related comments may form a single category.
3. The number of categories may vary from 5 to 20, depending on the quantity and complexity of the pupil responses involved.

Examples of both key categories (designated by roman numerals) and pupil comments related to those categories are supplied on the following pages.

Sample "Key" Categories and Related Comments

I. Classroom Work

1. "I like to work on projects with others" ... "Working together was a lot of fun" ... "We gave each other ideas and learned more"
2. "I liked to work alone" ... "Come up with my own ideas" ... "Do things on my own"
3. "Liked class discussion" ... "Learn and understand more" ... "Speak your mind" ... "Liked to tell others about my work"

II. Grades and Tests

1. "Liked the idea of no grades and tests" ... "Didn't have to worry" ... "Work easier without pressure"

III. Workload

1. "I had to do hard work but I liked it" ... "We are doing twice as much as last year and I like it this way"
2. "We were promised study halls" ... "I need a study period during the school day"
3. "The work is too demanding" ... "The pressure is too great" ... "They rush us too much"
4. "It has been fun and easy" ... "It's not hard to do the work and some of it is a lot of fun"
5. "The work was too easy" ... "We didn't do any work and it's no fun at all"
6. "There was too much work" ... "In the booklets there were too many questions and too much work" ... "We had too many reports to do"

7. "Too much homework" ... "Homework piles up" ... "Teachers all give assignments on the same day" ... "The teachers don't adhere to the homework plan"

IV. Subject Matter

1. "The work was boring" ... "The most boring part was the reading" .. "We went over things too many times and it got boring"

2. "The work I had to do so far has been fun and interesting" ... "I liked the projects, they were interesting" ... "The primates were especially interesting"

3. "We didn't have enough time for the work" ... "I wish we could spend more time with one subject"

4. "Teachers spent too much time on some activities" ... "I got bored"

V. Projects and Activities

1. "The projects and activities are fun and exciting" ... "The activities were fun--it's what I like to do" ... "It was a lot of fun"

2. "I liked the variety of the subjects" ... "We weren't just doing one particular thing" ... "You learn about different kinds of animals and people"

3. "I really enjoyed doing skits" ... "It's really a lot of fun because we get to write plays" ... "Very interesting, we got to do plays"

VI. Benefits

1. "The course taught me new things" ... "You learn a lot about animals that you never knew before" ... "You learn how animals live"

2. "The course helped me to read better" ... "I learned to express my feelings" ... "My attention span improved" ... "I learned to spell better"

3. "We learned about man's role in nature" ... "They taught us about animals related to man" ... "We studied how animals lived and how they are different from man"

VII. Audiovisual Materials

1. "We get to see cool films" ... "I liked the films they showed me" ... "You learn more because of films"

2. "The material was repeated too many times" ... "We saw the salmon film 5 times, just imagine, 5 times" ... "We did the same things over and over"

3. "The booklets were interesting" ... "I never had booklets before and Social Studies was never as much fun" ... "I liked the booklets about animals"

4. "The booklets were boring and had no color" ... "You have to read all those booklets and it's not any fun" ... "The booklets had too many questions"

WORKSHEET FOR LISTING KEY CATEGORIES MENTIONED IN PUPIL RESPONSES

List the key categories mentioned in pupil responses, giving sample comments for each category. Insert blank sheets of paper here, if more pages are needed.

TABULATING OPEN-ENDED INDICATOR DATA

Purpose

To tally and total the number of times each of the selected categories is mentioned in the pupil responses.

Procedures

A. A tabulation sheet should be provided (see the sample worksheet for tabulation on the next page) with indicator code numbers listed on the left and response categories indicated along the top.

B. The indicators are re-read with special attention being given to the responses which relate to any one of the categories established when the responses were categorized.

C. Tally and total the responses (see the sample tally worksheet on page 4-14).

SAMPLE

WORKSHEET FOR TABULATING OPEN-ENDED INDICATOR

From left, the columns in this sample worksheet show: the indicator code numbers sampled, the overall attitudes of the individual pupils, and the pupil responses given on the key categories involved. Note that a generally positive pupil (see code number 32) might have given negative responses in some categories.

Class: A Number of Indicators Sampled: 15

INDICATOR CODE NUMBER	OVERALL PUPIL ATTITUDE	KEY CATEGORIES							
		1. CLASSROOM WORK	2. GRADES AND TESTS	3. WORKLOAD	4. SUBJECT MATTER	5. PROJECTS & ACTIVITIES	6. BENEFITS	7. AUDIOVISUAL MATERIALS	8. OTHER
01	+	+		0		+			
04	0		-	-	+			+	
07	-	-			-		+		
08	++	++		+	+	+		++	
09	++		++		++	++			
11	0	0		0					
13	+	+	+		+		0		
14	+		+		+		+	+	
18	+			+		+		+	
20	0		-	+		-		+	
21	+		+	+	+		0		
22	++	+	++	++		+		++	
25	-		-		-		+		
30	+	+	+	-		+	+		
32	+		+		0	-	-		

WORKSHEET FOR TABULATING OPEN-ENDED INDICATOR DATA

Tabulate your data (by classroom) in the space provided below following the sample format on page 4-12. Insert blank sheets of paper here, if more pages are needed.

SAMPLE

WORKSHEET FOR TALLYING OPEN-ENDED INDICATOR DATA

To continue the example given on page 4-12, the tally sheet below provides summarized information for one classroom on both overall pupil attitudes and their attitudes on each key category. For example, the three totals circled on the sample sheet below--4, 1, and 1--indicate that of the six pupils (4 + 1 + 1 = 6) with positive overall attitudes, four responded positively (++, +), one responded neutrally (0), and another responded negatively (-, --) on the key category of workload.*

Key Categories	Category Classification	Overall Attitude Classification					
		Positive (++, +)	(Total)	Neutral (0)	(Total)	Negative (--, -)	(Total)
1. Classroom Work	Positive (++, +)	~~////~~	5		0		0
	Neutral (0)		0	/	1		0
	Negative (-, --)		0		0	/	1
2. Grades and Tests	Positive (++, +)	~~////~~ //	7		0		0
	Neutral (0)		0		0		0
	Negative (-, --)		0	//	2	/	1
3. Workload	Positive (++, +)	////	4	/	1		0
	Neutral (0)	/	1	/	1		0
	Negative (-, --)	/	1	/	1		0
4. Subject Matter	Positive (++, +)	~~////~~	5	/	1		0
	Neutral (0)	/	1		0		0
	Negative (-, --)		0		0	//	2
5. Projects & Activities	Positive (++, +)	//// /	6		0		0
	Neutral (0)		0		0		0
	Negative (-, --)	/	1	/	1		0
6. Benefits	Positive (++, +)	//	2		0	//	2
	Neutral (0)	//	2		0		0
	Negative (-, --)	/	1		0		0
7. Audiovisual Materials	Positive (++, +)	////	4	//	2		0
	Neutral (0)		0		0		0
	Negative (-, --)		0		0		0
8. Other	Positive (++, +)						
	Neutral (0)						
	Negative (-, --)						

---

*To simplify processing, you may change the five-point scale (++, +, 0, -, --) into a three-point scale, i.e., positive (++, +), neutral (0), and negative (-, --). You should be aware, however, that by collapsing the five categories into three, some information may be lost.

WORKSHEET FOR TALLYING OPEN-ENDED INDICATOR DATA

Tally your data in the space provided below following the sample format on the preceding page. Insert blank sheets of paper here, if more pages are needed.

If you also have rating-scale indicator data to process, continue reading.

Otherwise, turn to page 4-21.

PROCESSING RATING-SCALE INDICATOR DATA

It is relatively simple to tally information from rating-scale indicators, because pupil responses are given in the form of numbers.

The procedures involved in tabulating the data are:

A. Entering pupil responses from the indicators sampled on a roster where indicator code numbers and item numbers are listed. See the sample on page 4-17.

B. Tallying and totalling the number of responses for each item according to scale value. See the sample tabulation worksheet on page 4-19.

SAMPLE

RATING-SCALE ROSTER

(FIVE-POINT SCALE)*

SCHOOL DISTRICT

School: ______________________________ Class: ____________

Number of students: ____________________

Item Code No.	A	B	C	D	E	F	G	.	.	.	. . . . . .	P
001	5	3	1	4	3	2	5				.	
002	3	3	2	4	1	3	4				.	
003	4	3	1	3	2	3	2				.	
004	4	2	3	4	3	3	3				.	
005	5	3	4	2	4	4	1				.	
006	5	4	2	3	1	3	2				.	
007	4	4	1	5	2	3	4				.	
008	3	3	1	4	3	3	3				.	
009	2	2	1	3	4	2	5				.	
010	4	2	3	5	1	1	3				.	
011	1	4	1	5	2	3	2				.	
012	3	2	2	4	3	2	1				.	
.	.	.	.	.	.	.	.				.	
.	.	.	.	.	.	.	.				.	
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.	.	.	.	.	.	.	.				.	
030	.	.	.	.	.	.	.				.	

*The numbers recorded in the body of this table are pupil responses to each item in terms of one of the five points (i.e., 5, 4, 3, 2, and 1) provided on the indicator.

WORKSHEET FOR TABULATING RATING-SCALE INDICATOR DATA

Make a roster for your data in the space provided below. Insert blank sheets of paper here, if more pages are needed.

SAMPLE

TABULATION WORKSHEET
FOR A RATING-SCALE INDICATOR
(FIVE-POINT SCALE)
SCHOOL DISTRICT

School:________________ Class: ________________

Number of students:________________

Scale Value / Item	1	(Total)	2	(Total)	3	(Total)	4	(Total)	5	(Total)
A	///	3	////	4	//	2	////	4	///	3
B		0	///	3	卌 //	7	卌 卌 卌	15	////	4
C	卌 /	6	卌 ///	8	卌 卌	10	///	3	///	3
D	卌 ///	8	卌	5	卌 卌	10	///	3	////	4
E	卌 ///	8	卌 卌	10	////	4	卌 ///	8		0
F	///	3	卌	5	卌 卌 卌 //	17	//	2	///	3
G	/	1	卌 ///	8	卌 卌	10	/	1		0
H	//	2	卌 //	7	卌 ///	8	卌 ////	9	////	4
I		0		0	卌 卌 卌	15	卌 卌	10	卌	5
J		.		.		.		.		.
K		.		.		.		.		.
L		.		.		.		.		.
.		.		.		.		.		.
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.		.		.		.		.		.
. P		.		.		.		.		.

This worksheet can be used both for tallying and totalling responses from a five-point scale indicator.

WORKSHEET FOR TALLYING RATING-SCALE INDICATOR DATA

Tally and total your data in the space provided below. Insert blank sheets of paper here, if more pages are needed.

SUMMARIZING THE DATA

(For Both Open-ended and Rating-scale Indicators)

PURPOSE

To compile the tabulated data from the worksheets into a meaningful and useful format.

PROCEDURES

A. Select a format for presenting the data.

The two basic formats used to present data are *tables* and *graphs*. The characteristics of tables and graphs together with samples of each can be found on pages 4-22 to 4-32. Both formats have advantages as well as disadvantages, but together they tend to complement each other functionally. It is usually desirable to use tables; although as a supplementary means of presenting information, graphs can be quite effective in many ways, especially in showing broad relationships.

B. Calculate the relevant statistics for the format you have selected.

Some statistics that may be appropriate are: *raw totals*, *frequency of responses*, *percentages*, *means*, and *range*. Information on what these statistics are and how to calculate them is supplied on pages 4-33 to 4-34.

C. Display the data using the most meaningful format to present the appropriate statistics.

Some basic principles for displaying data are outlined on the following page.

1. In the heading, all the critical information supplied (such as indicator code numbers, item numbers, categories of student responses, etc.) should be labeled.

2. All the critical information should be located appropriately.

3. The data should be statistically accurate as well as easy to read.

4. When specific exploration of a smaller area within a larger area is required, any detailed data displayed should also be presented separately.

5. For open-ended indicators, sample indicators as well as samples of pupil responses for each category should be included. See the sample table on pages 4-25 to 4-27.

D. Finally, write one or two paragraphs of concluding remarks about the summarized data. These remarks should be descriptive and objective and should highlight the significant aspects of the data.

Characteristics of Tables

1. Each table should have a descriptive heading.

2. Table should consist of rows of items and columns of groups (and subgroups, if required).

3. Each row and column should be clearly labeled; if there is not enough room to supply complete headings, abbreviations or symbols should be used which, in turn, should be keyed at the bottom of the table.

4. The most important figures, e.g., totals and/or extreme values, should be highlighted by darker printing or under-

lining. Any especially significant figure (e.g., a grand total) should be indicated by double underlining or by placing it within a box..

5. Tables should have a neat, uncluttered appearance and ample margins, yet there should be enough information on each sheet so that dozens of pages are not needed for the report and continuity is maintained.

6. The data should be expressed in whole numbers or decimals rather than fractions and figures should be rounded off to the appropriate unit. The exactness of the figures (number of decimals, etc.) should be consistent and data should be lined up evenly in terms of the decimal points.

7. All information needed to interpret the table should be supplied on the page where the table appears.

A sample table for presenting ***open-ended indicator*** *data is given on the following three pages.*

A sample table for presenting ***rating-scale indicator*** *data is given on page 4-28.*

Turn to the sample table which presents the kind of data you are processing.

SAMPLE TABLE DISPLAY FOR OPEN-ENDED INDICATOR DATA

PUPIL-PERCEIVED NEEDS SUMMARY RESULTS FOR 11TH GRADE IPI MATH PROGRAM IN YAMPA VALLEY SCHOOL DISTRICT

Steamboat Springs, Colorado

Summary categories of pupil responses	Sample pupil comments	Section Number*	No. responding in this category	Percentage responding in this category	No. of students with an overall "+" attitude responding in this category	No. of students with an overall "-" attitude responding in this category
Work Load: includes all mention of the ease or difficulty of the work load.						
Easy	"The work was easy... easier than regular classrooms." "The work is hardly anything."	2-5	19	27%	16	3
		6-9	15	30%	14	1
		10-12	8	33%	6	2
		13-16	16	22%	15	1
Difficult	"The work is hard...half the time I don't understand it." "It was very difficult."	2-5	6	8%	4	2
		6-9	5	7%	5	-
		10-12	2	8%	2	-
		13-16	9	12%	4	5
Work Interest: the pupil's interest in or boredom with the units and activities or the subject matter itself ...						
High interest	"The work was fun and interesting." "More interesting and more enjoyable classrooms."	2-5	36	51%	36	-
		6-9	42	58%	41	1
		10-12	7	28%	6	1
		13-16	37	51%	36	1
Low interest	"Was dumb, wasn't taught well enough to be interesting." "The work was very boring."	2-5	6	8%	3	3
		6-9	1	1%	-	1
		10-12	2	8%	-	2
		13-16	8	11%	2	6

*The following breakdown shows the total number of possible respondents in each section: 2-5:71, 6-9:76, 10-12:24, and 13-16:72.

Summary categories of pupil responses	Sample pupil comments	Section Number*	No. responding in this category	Percentage responding in this category	No. of students with an overall "+" attitude responding in this category	No. of students with an overall "-" attitude responding in this category
Course Benefit: comments on the usefulness of the work in aiding understanding and learning in general, or in teaching specific knowledge.						
Useful	"Teaches me things I never knew before." "Relevant ideas instead of just facts."	2-5	26	37%	26	-
		6-9	25	33%	25	-
		10-12	5	20%	4	1
		13-16	30	42%	22	8
Worthless	"The work is worthless and a waste of time." "The course didn't help me at all."	2-5	5	7%	-	5
		6-9	4	5%	-	4
		10-12	1	4%	-	1
		13-16	-	-	-	-
Reaction to Independence: includes comments made referring to the freedom and individual nature of the program.						
Positive	"I like the independence, it lets me work at my own speed." "Teaches me to think on my own."	2-5	29	41%	27	2
		6-9	33	43%	29	4
		10-12	9	38%	7	2
		13-16	35	49%	32	3
Negative	"I need to be pushed." "Prefer to have my work mapped out." "Need more structure."	2-5	2	3%	1	1
		6-9	-	-	-	-
		10-12	-	-	-	-
		13-16	-	-	-	-

*The following breakdown shows the total number of possible respondents in each section: 2-5:71, 6-9:76, 10-12:24, and 13-16:72.

Summary categories of pupil responses	Sample pupil comments	Section Number*	No. responding in this category	Percentage responding in this category	No. of students with an overall "+" attitude responding in this category	No. of students with an overall "-" attitude responding in this category
This course vs. last year's program: attitudes toward the new program when compared with last year's classes. Comments of both general and specific nature are included.						
Positive on new	"I like 'open spaces' better." "This is a better situation." "It's like being let out of jail."	2-5	44	62%	44	-
		6-9	37	49%	36	1
		10-12	9	38%	9	-
		13-16	52	72%	48	4
Positive on old	"I liked last year's classes much better." "Too disorganized." "Stick to English."	2-5	10	14%	-	10
		6-9	7	9%	-	7
		10-12	3	13%	-	3
		13-16	4	6%	-	4

*The following breakdown shows the total number of possible respondents in each section: 2-5:71, 6-9:76, 10-12:24, and 13-16:72.

SAMPLE

TABLE DISPLAY

FOR RATING-SCALE INDICATOR DATA

SCHOOL DISTRICT

School: ____________________ Class: __________

Number of students: __________

Item	Scale Value	Frequency of Responses	Percentage of Frequencies
A	5	15	50%
	4	7	23%
	3	5	17%
	2	3	10%
	1	0	0
B	5	0	0
	4	5	17%
	3	18	60%
	2	3	10%
	1	4	13%
C	5	4	13%
	4	3	10%
	3	10	33%
	2	10	33%
	1	3	10%
D	5	3	10%
	4	10	33%
	3	13	43%
	2	2	7%
	1	2	7%
E	⋮	⋮	⋮
⋮	⋮	⋮	⋮
P	⋮	⋮	⋮

This table records pupil responses to each item on the indicator (identified as A, B, ---, P) by frequency of response and percentage of frequencies on each scale value (5, 4, 3, 2, and 1).

Characteristics of Graphs

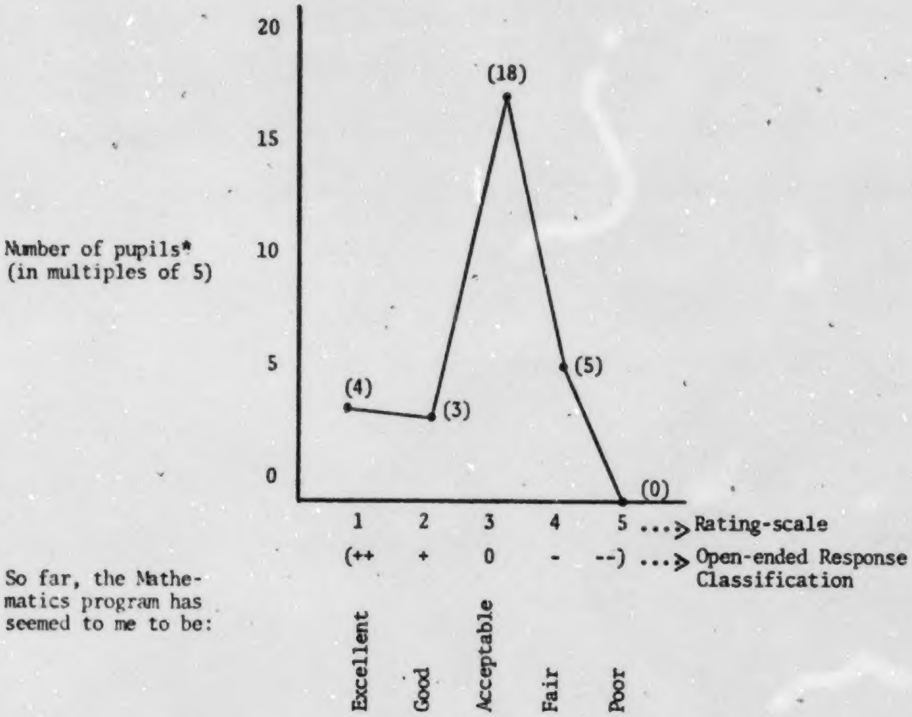
Three main methods of presenting data graphically are extensively used: (1) the line graph; (2) the bar graph or histogram; and (3) the divided circle or "pie" graph. Each has appropriate uses. For presenting data from either an open-ended or a rating-scale indicator, the line graph is least useful; the pie graph is most useful for presenting data indicated in percentages. Graphs should be drawn and labeled accurately and their potential for visual appeal should be exploited as much as possible. Shading or adding texture can be very useful, especially when contrasting histograms are used, with or without overlapping. If a limited number of copies of the summary report are needed, it might be worthwhile to consider coloring the graphs to increase their visual appeal.

Examples of all three kinds of graphs are presented on the following pages.

SAMPLE LINE GRAPH

SCHOOL DISTRICT

Total sample size: 150 pupils



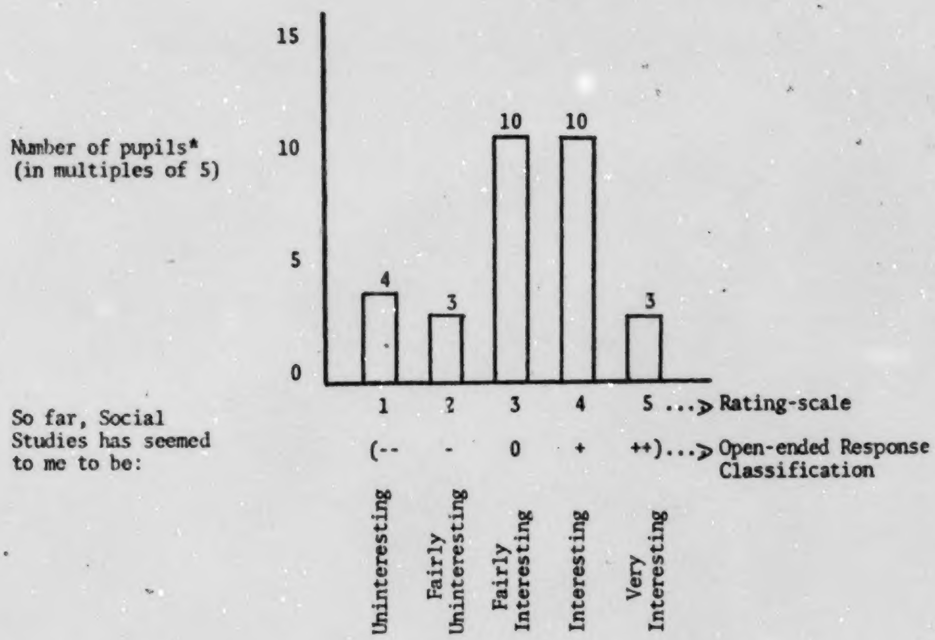
As this line graph shows, 20 pupils felt that the Mathematics program was excellent, 15 said good, 90 acceptable, 25 fair, and none felt that it was poor.

*Another way to present this information would be to change the numbers to percentages.

SAMPLE HISTOGRAM (BAR GRAPH)

SCHOOL DISTRICT

Total sample size: 150 pupils



As this histogram shows, 20 pupils felt that Social Studies was uninteresting, 15 students felt it was fairly uninteresting, 50 fairly interesting, 50 interesting, and 15 considered it very interesting.

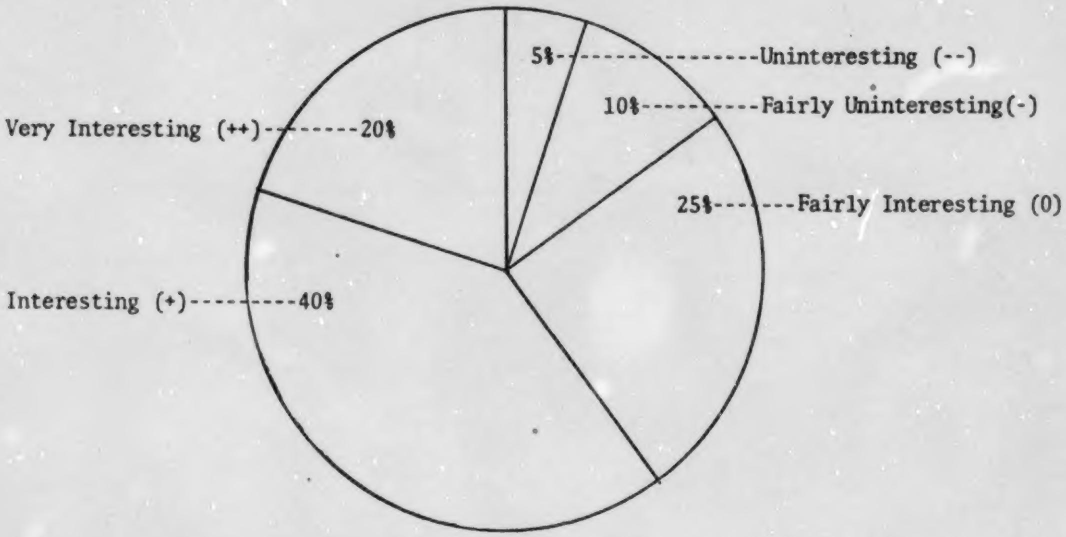
*Another way to present this information would be to change the numbers to percentages.

SAMPLE PIE GRAPH

SCHOOL DISTRICT

Total sample size: 150 pupils

Compared to last year's Mathematics program, the new Mathematics program is:



As this graph shows, 20% of the pupils sampled said that the new Mathematics program was very interesting, 40% said interesting, 25% fairly interesting, 10% fairly uninteresting, and 5% uninteresting.

Some statistics that are appropriate to use when displaying data are discussed below:

1. Raw totals

   Raw totals are the actual number of responses. They can be taken directly from the tally worksheets.

2. Frequency of responses

   The frequency of responses simply show how pupil responses cluster under each scale value (5, 4, 3, 2, 1) or each category of responses covered by an open-ended indicator. See the frequency column in the sample table display on page 4-28.

3. Percentages

   Percentages are derived by dividing the number of responses for each scale value by the total number of pupils in the group and multiplying the answer by 100. See the percentage column in the sample table on page 4-28. You can also make summary statements based on the percentages; on Item A in the sample table on page 4-28, for instance, 73% of the pupil responses were either 4 or 5 on a 5-point scale.

4. The mean (or average value)

   The mean is obtained by adding a series of figures and dividing the total by the number of figures involved. For example, to find the mean for the following series of numbers--6, 8, 7, 4, and 5--divide 30 (the total) by 5 (the number of figures); in this case, the mean is 6.

   Sometimes frequency has to be taken into consideration when calculating the mean. For example, the response frequencies for one item are indicated on the following page.

Scale Value	Response Frequency	Scale Value X Frequency
5	40	5 x 40 = 200
4	32	4 x 32 = 128
3	5	3 x 5 = 15
2	10	2 x 10 = 20
1	3	1 x 3 = 3
	Total = 90	Total = 366

Mean = 366/90 = 4.07 or 4

This means that the scale value 4 is the mean value for student responses on this particular item.

5. Range

The range of responses is the spread from the highest to the lowest response given. For example, in a 5-point scale, the range is from 1 to 5, if responses are given for each of the five scale values.

INFORMATION SHEET 1

SUMMARIZED DATA

Display your data below in whatever format you consider appropriate. The following two pages have been provided in case more space is needed.

The completion of this task marks the end of your data processing effort. Return the summarized data to the Project Manager.

SUMMARIZED DATA

(continued)

SUMMARIZED DATA

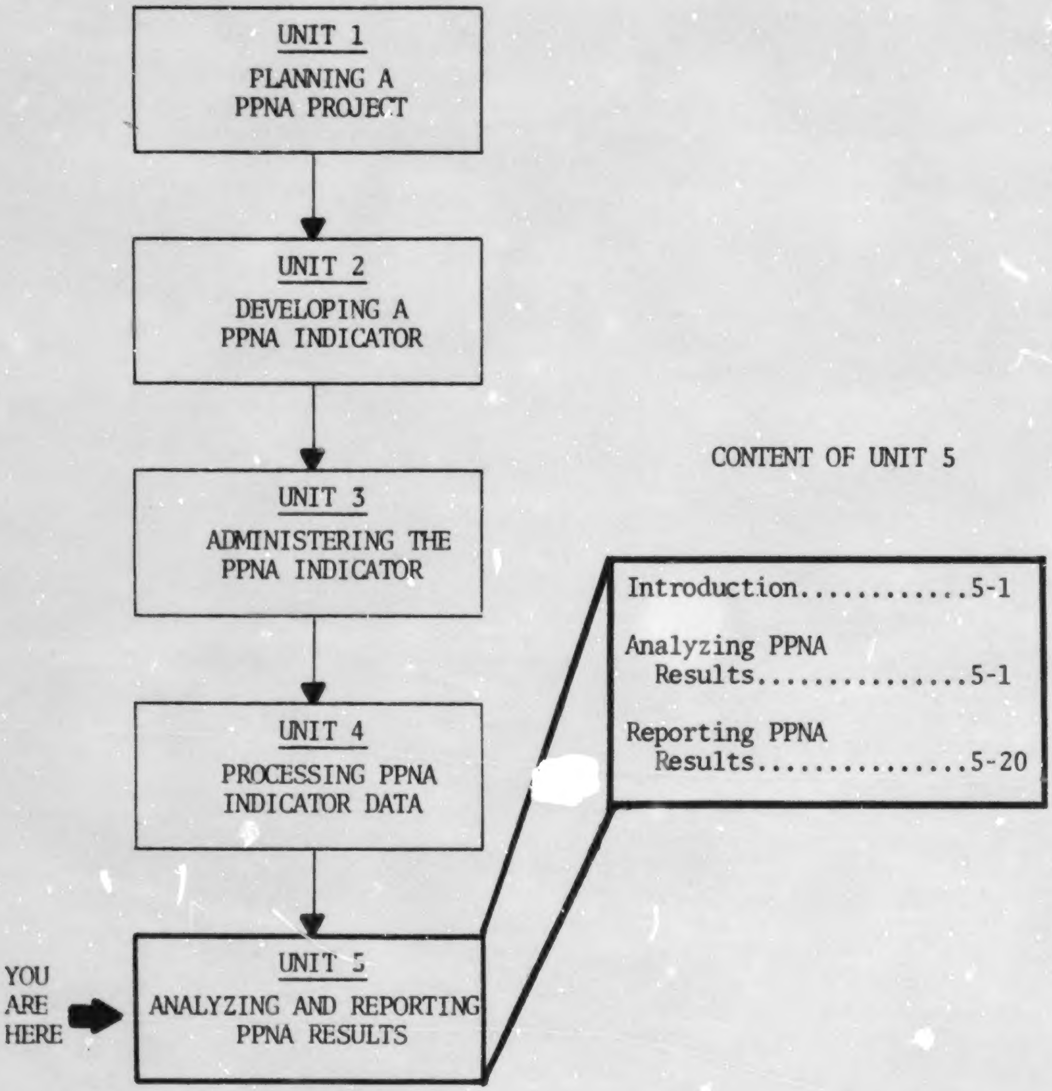
(continued)

UNIT 5

ANALYZING AND REPORTING PPNA RESULTS

For use by the people responsible for analyzing and reporting PPNA results.

SEQUENCE OF UNITS


UNIT 1
PLANNING A PPNA PROJECT
UNIT 2
DEVELOPING A PPNA INDICATOR
UNIT 3
ADMINISTERING THE PPNA INDICATOR
UNIT 4
PROCESSING PPNA INDICATOR DATA
UNIT 5
ANALYZING AND REPORTING PPNA RESULTS
YOU ARE HERE

CONTENT OF UNIT 5

Introduction............5-1

Analyzing PPNA
Results...............5-1

Reporting PPNA
Results...............5-20

INTRODUCTION

As you begin the task of analyzing and reporting the PPNA results, you should have tables or graphs and written summaries of the data which were prepared in terms of the basic statistics discussed in Unit 4 of this package. This unit is designed to help you perform two tasks in order to conclude your project appropriately. These tasks are: (1) examining the data analytically and (2) preparing a report on the project results which reflect pupil perspectives of the area being assessed. The report will provide information from pupils, that is, one of many sources of information which school district personnel can consider when making recommendations related to program planning and improvement efforts.

ANALYZING PPNA RESULTS

To examine how "good" or "meaningful" the results of your study are, you will have to evaluate three elements: (1) the validity and reliability of the PPNA indicator, (2) the way the data was collected, and (3) the procedures used to summarize and present the data. A serious flaw in any of these three areas could make the results worthless.

EVALUATING THE PPNA INDICATOR

Validity and reliability are two critical concepts that should be considered when evaluating any assessment or measurement instrument.

> *Validity* indicates the degree to which an instrument actually measures what it is supposed to measure. The validity of a PPNA indicator would depend upon the degree to which the indicator can supply information related to the purpose of the project.
>
> *Reliability* indicates the consistency of results obtained with a given instrument. If reliable, an instrument can be used over and over again in unchanging or highly similar situations and will produce the same or very similar results. In this sense, a rating-scale indicator is apt to be more reliable than an open-ended indicator. Reliability, however, is not as significant as validity in the case of an open-ended indicator, since it is designed to collect relatively subjective information from the pupils.

To check the validity of your PPNA indicator, you can take any of the three approaches described below:

1. Follow-up interviews -

   Interview a few pupils from the same sample asking several broad questions related to the purpose of the project but not included on the indicator. Correlate their oral responses with the written responses given on the indicator. If the oral and written responses are very similar, the indicator probably has high validity.

2. Expert opinions of the PPNA indicator -

   Ask people with experience in pupil survey questionnaire construction for their opinions of the validity of your PPNA indicator.

3. Test the results against those of another pupil survey questionnaire used for the same purpose -

   It may be very difficult to find such an instrument; however, whenever possible, compare your PPNA results with those of a similar, widely-recognized pupil survey instrument used for the same project purpose. The results from both instruments should be very similar, if your indicator has high validity.

To check the reliability of your PPNA indicator, you can take one of the approaches described below. (These approaches are more appropriate for rating-scale indicators than for open-ended indicators.)

1. Test-retest -

   Administer the same indicator to the same pupils a second time. The time interval between the first administration and the second should not be less than a week or longer than six months. If the two sets of responses are very similar, the indicator probably has high reliability.

2. Equivalent Forms -

   Develop another indicator with items parallel or similar to those in your indicator and administer the equivalent form to a group of pupils from the same sample. The two sets of responses should be very similar, if the indicator is reliable.

EVALUATING HOW THE DATA WAS COLLECTED

Assuming that the indicator does exhibit a reasonable degree of both validity and reliability, the next area to consider in evaluating the results is how the data were collected. Here, you should ask such questions as:

- Was the sample (if a sample was involved) representative of the total population covered by this assessment project?
- Did the people scoring the indicators have any known prejudices or preferences which would affect the results?
- Was the scoring procedure fair (unslanted)?
- Were questions presented in a neutral way?

Hopefully, the problems implied by these questions were avoided in your project, but history yields countless examples of cases where they were not; for example, the 1936 presidential election. In 1936, the Literary Digest polled 10 million of their subscribers by telephone and predicted a landslide victory for Landon on the basis of the responses they received. What happened? The sample taken only included people from one segment of the population; it was not representative. The people in the sample did indeed vote overwhelmingly for Landon; but the masses, who could not afford telephones and magazine subscriptions, elected Roosevelt. Such a sample is considered "biased," i.e., not representative of the total population.

As another example of the way results can be biased, consider the World War II survey described on the following page.

> A national survey center sent out two teams to interview Southern blacks on issues related to the war. One team was entirely made up of white interviewers, the other entirely of black interviewers. One of the questions was, "Is it more important to concentrate on defeating the enemy or to concentrate on making democracy work better here?" According to the responses given to the black interviewers, 39% were more interested in defeating the enemy; according to the answers given to the white interviewers, 62% were more interested in defeating the enemy. Other questions in the survey showed similarly different response patterns.

The results were obviously extremely biased and, therefore, worthless. But why were the results biased? Did the two teams of interviewers select different kinds of people to interview or did the respondents' attempts to give acceptable answers bias their responses? Either or both of these explanations could be valid. Similarly, Pupil-Perceived Needs Assessment results could be biased. For instance, do students answer in the same way when their teachers administer a questionnaire as when other people administer it?

What can be done if you think the results are biased in some way? Does this mean that the results are entirely inaccurate or incorrect? Not necessarily; it only means that it is more likely that the results are not accurate. In a case like this, you would be less inclined to rely on the results. Thus, as you review or plan a study or assessment project, it is important to try to identify possible sources of bias. The exercise on the following pages will provide an opportunity for you to practice considering several hypothetical assessment projects to identify any possible sources of bias involved.

EXERCISE 1

Read the descriptions of the following Pupil-Perceived Needs Assessment projects. Identify any possible sources of bias, then check your comments against the discussion on page 5-9.

1. The English Department of John Doe High School initiated a new program of individualized reading hoping it would inspire pupils to read more widely. To evaluate the effects of the new program, a questionnaire (mostly open-ended) was administered to the pupils a month before the program began and again four months later. All pupils completed the questionnaire. Since no funds were available for the project, Mr. Kane, the head of the Department, had the teachers score the indicators from their own classes. All coding and tallying for the first administration of the indicator was completed before the second administration.

2. Mr. Hopkins, Miss Jones, and Mrs. Smith, the three counselors at Manual Junior High School, are interested in expanding the pupil activity program. In order to get funding from the Board of Education, they must demonstrate pupil interest in this project. Therefore, they developed a rating-scale questionnaire and administered it to all pupils during study hall periods. Pupils were not instructed to write their names on the questionnaires. See the sample question from this questionnaire on the following page.

EXERCISE 1 (continued)

How often do you participate in the meetings and activities of your favorite club?

_____absolutely never
_____very seldom
_____seldom
_____sometimes
_____frequently

3. The XYZ University, in cooperation with the State of New York, was interested in discovering the relationship between the participation of high school students in school decision-making (actual as well as perceived) and success in achieving a few important academic and non-academic goals identified by school personnel. The following plan was devised:

> Information to be used in examining pupil participation in decision-making was to be gathered through a survey of pupils and teachers in four urban high schools. The questionnaire for the pupils was designed to take about 45 minutes (a normal class period) to complete and was to be administered during English periods by members of the University research staff. The schools involved in the project were selected from two large urban school systems within the state and were selected because the pupils were from different social and racial groups.

DISCUSSION OF EXERCISE 1

Your comments on Exercise 1 should include most of the following points:

1. There are several sources of possible bias in this study:

   - The teachers were asked to score their own pupils; therefore, their preconceived ideas about pupil attitudes or abilities could easily affect the results. This would probably be true even if the pupils' questionnaires were not identified by name, since most teachers can recognize the writing styles and handwriting of at least some of their pupils.

   - The teachers knew whether they were scoring a "before" or "after" questionnaire. If a teacher had strong feelings (either positive or negative) about the new program, that attitude might well influence the results. Also, when scoring, individual teachers may develop different categories of pupil responses. This would make tallying and summarizing the data difficult.

   - Finally, if the pupils knew that their teachers would be scoring the questionnaires (or, for that matter, even suspected it), they might be influenced to give "acceptable" answers.

2. Probably the principal source of bias in this example lies in the way the question is worded: "of your *favorite* club." Maybe it should be changed to, "How often do you generally participate in club meetings and activities?" Another source of bias in this example lies in the fact that the rating-scale is not balanced; that is, "absolutely never" and "frequently" are not really opposites. Thus, ratings would tend to lump toward the high side of the scale. A better scale would be: almost never, seldom, sometimes, frequently, almost always.

3. In this example, it is questionable whether the sample selected accurately represents all of the high schools in the state "Large urban school systems" would probably have pupils with different characteristics than pupils in small rural schools. If the researchers wish their study to cover New York high schools in general, a more representative sample would have to be used.

EVALUATING THE PROCEDURES USED TO SUMMARIZE AND PRESENT THE DATA

So far, in your evaluation of PPNA results, you have considered both the indicator and the way the information was collected. Now you must look at the methods followed in summarizing and presenting the data. Do the results present the whole picture? Are there multiple possible explanations for the results? These are but a few of the questions you should ask.

Most studies or assessment projects involve comparisons. Your project probably was designed around one or more of the following common types of comparisons: before-after comparisons, comparisons of different treatments, and comparisons between subpopulations. Implicit in such comparisons is the assumption that a cause-effect relationship may exist. For example, if a before-after comparison shows much higher scores *after* instruction, the implication is that the instruction *improved* the scores. In fact, this may or may not be true. Perhaps the students cheated on the second questionnaire, or perhaps most of them recently had seen a TV show on the subject. Explanations like these also could account for different results. One of the purposes of planning in research is to attempt to eliminate as many alternative explanations as possible.* Nevertheless, when reviewing study results, you should be aware of possible alternative explanations. Suppose you do discover some alternative explanations; what does this mean, and what can you do about it?

Consider the following example:

> The Elwood School decided to experiment with a new Social Studies program for sixth grade pupils. Ms. Jones, one of the sixth grade teachers, volunteered to test the program on her class. After three months, a questionnaire was given to all sixth grade pupils concerning their attitudes toward Social Studies. The pupils in the new program (Ms. Jones' class) had much more favorable attitudes than the other pupils.

The implication is that the new program caused the more favorable pupil attitudes. In this case, however, a very obvious alternative explanation is possible--namely, that Ms. Jones' class had different attitudes because of *her* attitude and teaching methods. If this is true, her pupils would probably have the same favorable attitudes whether she was teaching the new or the old program. Without more information, we cannot determine whether Ms. Jones or the new program made the difference.

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*For an excellent source on experimental design information (i.e., planning studies to avoid alternative explanations), see Campbell, D. T. and Stanley, J. C. Experimental and Quasi-Experimental Designs for Research. Chicago: Rand McNally, 1963.

When several explanations of the results are possible, as in the foregoing example, it is necessary to support your results by either citing similar results from other studies or doing the study a second time, in an attempt to eliminate one or more possible alternative explanations. For example, if three other schools also found more favorable attitudes toward Social Studies in pupils taking the new program, it would be reasonable to conclude that the new program probably helped develop those attitudes. In this case, careful planning could have clarified the results by eliminating the alternative explanation. If the program had been introduced into *three* classes instead of one, and if student attitudes had been tested before as well as after the new program was introduced, the results would have made it possible to rule out the explanation that Ms. Jones was responsible for the attitudes discovered among her pupils.

Alternative explanations must be considered even when the comparisons show no differences. Why? Because that result (i.e., no difference) may be related to something other than the program or variable being studied. The following case provides a perfect example.

> During 1969-1971 the Office of Economic Opportunity (OEO) conducted several experiments to assess the value of per-

> formance contracting.* In 18 different test sites, pupils were divided into two groups with instruction provided to one group by the performance contractors and to the other group by teachers taking a traditional approach. The results of the experiment showed no difference between the two groups. Is it reasonable to conclude, therefore, that the program offered by the performance contractors was no more successful than the traditional approach? No. Further study of the experimental schools revealed that both groups of pupils exceeded average performance shown in previous years by over a year in most of the test sites. This was due to the fact that the teachers did not perform in a "typical" manner. Or, as one OEO observer expressed it, "Those teachers were out to show that they could do a better job than the outsiders" (the performance contractors).

The methods used to present the results must also be carefully scrutinized. Does a graph or table reflect the total picture? Are the results presented in such a way that misinterpretations are avoided? The examples on the following pages show some common pitfalls in presenting results.

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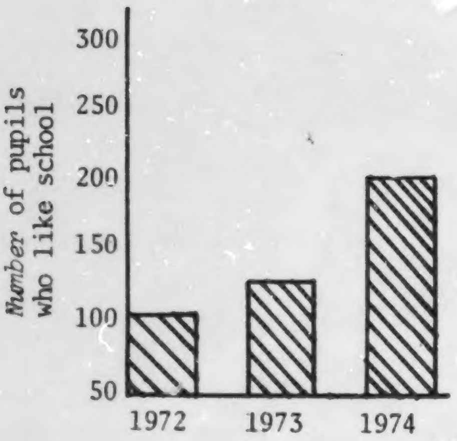
*Performance contracting is the practice of giving contracts to outside organizations to improve pupil reading levels or other similar skills. Usually the outside organization is paid only if the specified pupil performance levels are achieved.

Example 1:

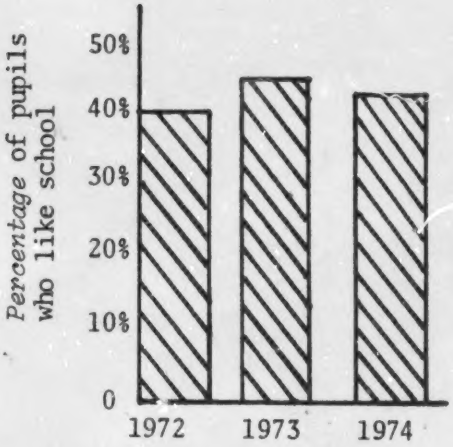
GRAPH A

Pupil Attitudes
Improved



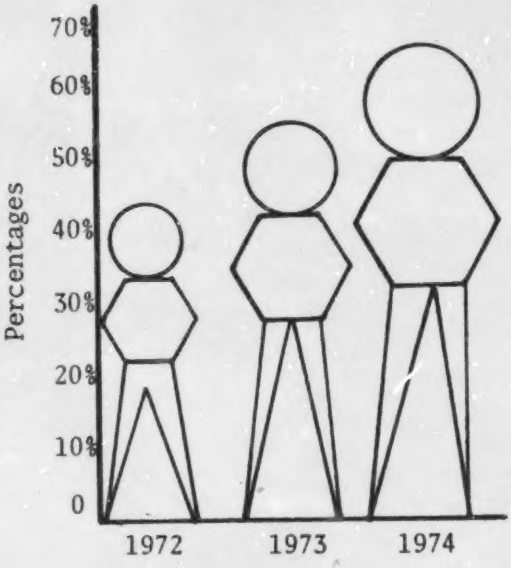
GRAPH B

Pupil Attitudes
Did Not Improve

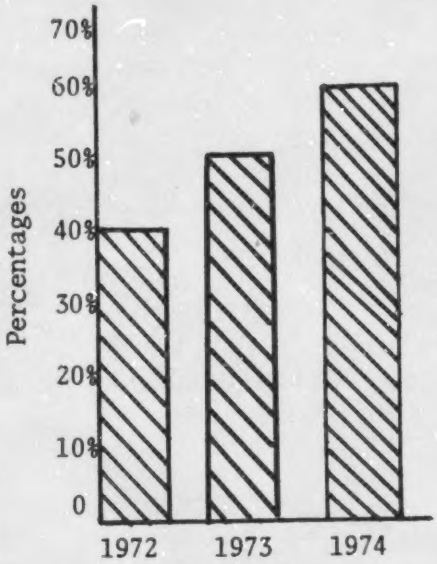


The two graphs above show different results because one is based on the *number* of pupils who like school while the other is based on the *percentage* of pupils who like school. Since the total number of pupils increased between 1972 and 1974 (from 240 to 278 to 476), percentages show pupil attitudes more accurately.

Example 2:


GRAPH A

Percentage of Pupils Participating in Political Activities


GRAPH B

Percentage of Pupils Participating in Political Activities

Although the figures used in Graph A are visually more effective, Graph B shows the steady increase in participation more accurately. The figures are in proportion by height but not by mass (area), therefore, the percentages reported using the figures are distorted.

The exercise on the following page will provide an opportunity for you to review the methods used to present the results of an hypothetical assessment project.

EXERCISE 2

Read the following description of a project assessing pupil attitudes. Do you agree with the conclusions? Why do you agree or disagree?

> The librarians of the Red City Junior High School have been concerned about pupil use of library facilities. A new set of procedures was planned which went into effect in January, 1974. In order to assess pupil perceptions of the effectiveness of the new procedures as well as their attitudes toward them, a questionnaire was given to all 550 students (250 boys and 300 girls) on December 20, 1973 and on March 20, 1974. Since previous experience had indicated a difference between girls and boys in their attitudes regarding the library, it was also decided to consider the responses of the boys and the girls separately. One question asked the pupils to indicate how easy it was for them to locate books. Their answers are tabulated below.

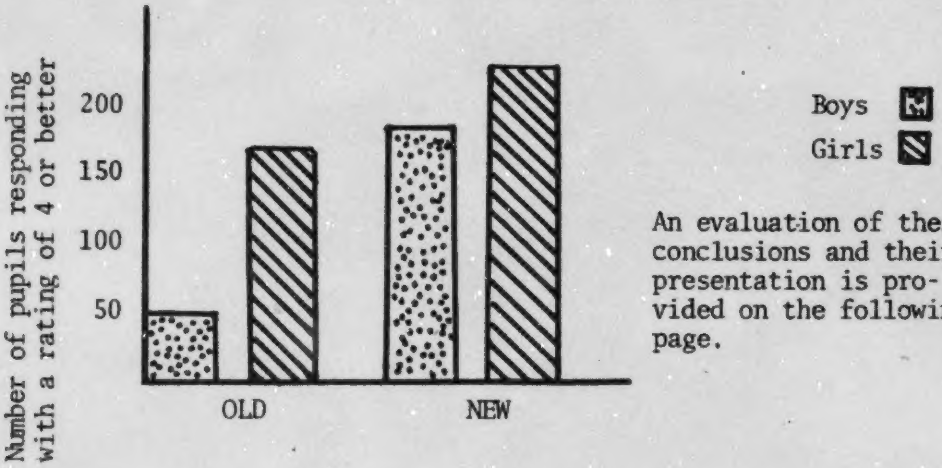
	December Testing		March Testing	
Scale Value	Boys	Girls	Boys	Girls
5 (very easy)	20	50	100	120
4 (easy)	30	120	80	90
3 (adequate)	100	80	50	60
2 (difficult)	50	40	10	20
1 (very difficult)	50	10	10	10

See the conclusions on the following page.

EXERCISE 2 (continued)

Conclusions:

- both boys and girls found it easier to find books under the new library procedures.
- girls found it easier to locate books under both the old system and the new one, as indicated in the graph below:



An evaluation of these conclusions and their presentation is provided on the following page.

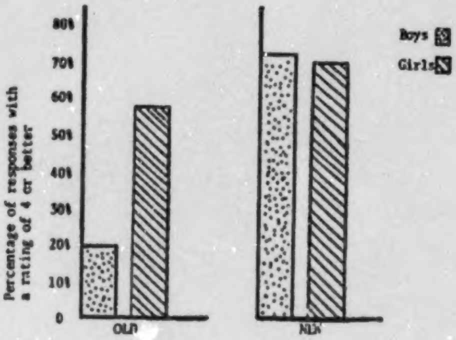
DISCUSSION OF EXERCISE 2

In reviewing the foregoing assessment project, you probably should consider the following points:

- Assuming that the pretest results were reliable (that they were not affected by testing just before a holiday), the results do indicate pupil perceptions of increased ease in locating books. The increased ease reported probably is related to the new procedures (according to the information presented).

- Although the pretest data show girls responding with higher ratings than boys on this item, the post-test data do not show this when the results are presented in percentages. Since there are more girls than boys in the sample, it would be better to use percentages both in tabulating the responses and in the graph, as shown below.

	December Testing		March Testing	
Scale Value	Boys	Girls	Boys	Girls
5 (very easy)	8%	17%	40%	40%
4 (easy	12%	40%	32%	30%
3 (adequate)	40%	27%	20%	20%
2 (difficult)	20%	13%	4%	7%
1 (very difficult)	20%	3%	4%	3%



Evaluating your results is the first step in developing confidence in them and in any recommendations to be based on them. To obtain further support for your results, you could take any of the following steps:

- retest the original sample through observation, interviews, or another questionnaire
- determine staff, administrator, or parent reaction to the findings
- test other pupils with similar backgrounds or characteristics
- review the professional literature dealing with the problem under study
- consider other related factors such as truancy rates, vandalism, voluntary attendance, etc.

In considering the steps outlined above, keep in mind that they would only be taken to determine if the new information collected supports the results of the original assessment project. If discrepancies are found, the data should be reassessed, alternative explanations investigated and, perhaps, more information collected.

REPORTING PPNA RESULTS

PPNA data are collected to provide information on which to base decisions or recommendations; but other groups involved in the educational process--parents, teachers, community members, etc.--must also be considered. Pupil-perceived needs data provide information from only one source. Failure to consider information from other sources will weaken any recommendations made.

Typically, it will be necessary to report results to an advisory group, parents, school district personnel, or others. Although preparing a comprehensive, clear report is a difficult task, the following guidelines should be helpful:

A. The report should include the following information:

  1. Purpose of the project.
  2. Participants in the project.
  3. Procedures followed.
  4. Data collected, together with an analysis.
  5. Relationship of summarized data to the purpose of the project.
  6. Results.
  7. Discussion of unexpected findings and possible alternative explanations.

B. In writing the report:

1. Consider the audience involved: their sophistication, their need for technical data, questions they might ask, etc.
2. Look back through the whole package, referring to the pink information sheets in each unit. The decisions or information on those sheets will help you to prepare the report.
3. Write the report as briefly and simply as possible. Simple sentence construction will enhance clarity.

The distribution of the report will depend on your situation. You should consider including pupil participants, principals, teachers and other school personnel involved, parents, your immediate supervisors, and the members of any advisory group. Usually, the people who have participated in a project of this kind are very interested in the results, and a good way to assure their cooperation in future studies or projects is to provide them with information on the results.

The final step in any study, a Pupil-Perceived Needs Assessment or any other project, should be a review of the entire effort. Was the project worth the effort, time, and money that were expended on it? Where did problems occur? Would you do it again? What would you change if you were starting another project? This type of evaluation is essential if future projects are to be improved on the basis of past experience.

INFORMATION SHEET 1

Write a summary report on your PPNA results.

SUPPLEMENT

SAMPLING

For use by the people responsible
for sampling activities related to
a PPNA project.

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SECTION II

Drawing the Final Sample.................................. S-19

The sampling technique described in this Supplement has been especially designed for use in this package. The rationale and validity of this technique also have been carefully examined and approved by an independent professional statistician.

The Supplement contains two sections. Section I helps you to determine the total sample size for your PPNA project, as well as the percentage of total classrooms to be sampled, and the number of indicators to be scored from each classroom sampled. The procedures described in Section I should be completed before the PPNA indicators are reproduced so that you will know how many copies are needed. Section II helps you to draw the final sample for processing your PPNA data, and the procedures described there should be completed before the data are processed.

SECTION I

DETERMINING SAMPLE SIZE

The total pupil population involved in your PPNA project may be too large for you to collect information from each and every pupil. If this is the case, you will want to draw a sample of the total population. This task has to be completed before the PPNA indicators can be reproduced.

When you begin to think about this problem, the first questions to be asked are, "What size sample is sufficient for my project?" and "What samples do I want to take?" The purpose of this section is to provide some concrete guidelines to assist you in answering these questions.

First of all, you have to decide whether or not to break down the total population into several subpopulations. For instance, if you are interested in assessing the attitudes of high school pupils (10th, 11th, and 12th graders) toward their Science program, you might want to compare the data for each of the three grade levels, if different areas of Science are studied in each of these three grades. Thus, you would treat each grade as a subpopulation and draw a separate sample from each grade. You should keep in mind that the use of subpopulations will require a larger total sample than would be needed if the total population were not broken down into subpopulations.

MINIMUM PERCENTAGE FOR SAMPLING

Table 1 below helps you to determine the minimum percentage needed to sample any population or subpopulation involved in your PPNA project. Of course, higher percentages than the minimum percentages indicated can also be used.

TABLE 1

Population Size (Number of Pupils)	Minimum Percentage for Sampling
89 or less	100%____
90 - 119	63%____
120 - 179	50%____
180 - 239	40%____
240 - 299	32%____
300 - 449	25%____
450 - 599	20%____
600 - 899	16%____
900 - 1,349	13%____
1,350 - 1,799	10%____
1,800 - 2,249	8%____
2,250 - 2,699	6%____
2,700 and up	5%____

Each percentage listed under Minimum Percentage for Sampling is the mid-point percentage for the corresponding population range. "Minimum" means that any percentage higher than the percentage shown on Table 1 for a given population range would be equally acceptable to use in determining the percentage to be used in sampling a given population.

In order to find the minimum percentage for sampling *your* total population, follow the steps below:

1. Find the appropriate population range for your population in the left-hand column of Table 1. If several subpopulations are involved, find the population range for each of them.
2. Put a check mark (✓) next to the percentage across from the population range which covers your population (or subpopulation).

Consider the example of an assessment of a high school Science program presented on page S-1. Suppose that the total population involved is 600 pupils, with 240 in the 10th grade, 180 in the 11th grade, and 180 in the 12th grade. If you wish to compare results by grade, the total population (600) should be broken down into three subpopulations (240, 180 and 180). According to Table 1, the minimum percentage for sampling 240 is 32%, or 77 pupils, and the minimum percentage for sampling 180 is 40%, or 72 pupils. Adding these three samples together

(77 + 72 + 72) gives you the total sample, i.e., 221 pupils. As you can see from this example, breaking the total population down into subpopulations increases the total sample, since for 600 pupils, the minimum percentage for sampling would be 16%, or 96 pupils.

CONSIDERING SECONDARY VARIABLES THAT MIGHT INFLUENCE THE DECISION ON A MINIMUM PERCENTAGE FOR SAMPLING

Any variables which are used to determine subpopulations are called *primary variables*; these might include grade levels, different treatments, different ability levels as reflected in a tracking system, different schools, etc. In addition to these variables, there might be variables which, although you do not want to analyze them explicitly, might affect your data. These are *secondary variables.* For instance, when you are analyzing data from different classes, the characteristics of the pupils and/or teachers may vary in ways that significantly affect their attitudes but cannot be treated as *primary variables.*

Some possible secondary variables are listed below:

1. Grade levels (or ages, if the school is ungraded)
2. Socio-economic characteristics of different neighborhoods where the schools are located
3. Intellectual abilities
4. Sex

5. Race
6. Family socio-economic status
7. The length of time the pupils have been exposed to the program being assessed
8. Training and personalities of individual teachers

If any of the variables listed above were used to define your subpopulations, they should not be considered *secondary variables*. For instance, if you want to compare the attitudes of 10th, 11th, and 12th grade pupils toward Science, "grade level" would not be considered as a *secondary variable*, since grade levels were used to determine the subpopulations, i.e., as a *primary variable*. Some other secondary variables, such as the socio-economic characteristics of different neighborhoods where the schools involved are located, intellectual abilities, or the training of individual teachers for the Science program, may still have to be considered.

Once you have taken any primary variables into account by dividing the total population into subpopulations, you must decide how to handle any secondary variables which might affect your data. This involves assessing the relative importance of differences *among* and *within* classrooms, in order to determine what kind of sampling will produce data of maximum accuracy. The greater the differences *among* classrooms, the more advisable it is to sample more classrooms and score fewer indicators within each classroom for a given total sample. Relative differences *among* and *within* typical classrooms should be assessed in terms of three broad categories: *negligible, moderate,* or *great.* To help you to accommodate the effects of these differences, Overlays X, Y, and Z have been developed to be used with the Sampling Chart on page S-9. The overlays are used to determine the most efficient statistics to use for given populations.

If differences *among* classrooms are considered *negligible*, use Overlay X with the Sampling Chart; if *moderate*, use Overlay Y; and if *great*, use Overlay Z.

Answering the following questions will help you determine which overlay to use:

1. Are there any significant differences *among* classrooms?

    ____ No. Use Overlay X.

    ____ Yes. Go to the next question.

2. Are the differences *among* classrooms as *great* or *greater* than the differences *within* typical classrooms?

    ____ No. Use Overlay Y.

    ____ Yes. Use Overlay Z.

WORKSHEET 1

Fill out this worksheet with information on your PPNA project:

1. Consider the total population involved in your PPNA project. Do you want to break it down into subpopulations?

   ____ Yes.

   ____ No.

2. If *yes*, list the subpopulations below.

3. Record the decisions you have made on which overlay to use for your population or subpopulations below.

USING THE SAMPLING CHART

After you have estimated the effects of any secondary variables involved and selected the overlay to be used with the Sampling Chart, you should be ready to decide on an effective sample for each population involved, using the Sampling Chart provided on page S-9 with the appropriate overlay. (The overlays are in the pocket at the back of this Supplement.)

On the Sampling Chart, the top row lists the percentages for sampling from the right-hand column of Table 1 on page S-2; the percentages of classrooms to be given the PPNA indicator are listed along the left-hand side of the chart. Both sets of figures represent percentage *ranges*. If the percentage of classrooms you have decided to sample lies between any two percentages on the chart, the closest percentage should be used. For example, if school district personnel want 15% of all the classrooms involved to be given a PPNA indicator, the closest percentage (16%) would be used. The fractions on the chart indicate how many indicators should be scored in each class sampled to provide accurate data on the total population involved.

The Sampling Chart will help you modify the minimum effective percentage for sampling by enabling you to take into consideration any secondary variables which might affect your data.

SAMPLING CHART

PERCENTAGE OF CLASSROOMS TO BE GIVEN THE INDICATOR	PERCENTAGE FOR SAMPLING												
	100%	63%	50%	40%	32%	25%	20%	16%	13%	10%	8%	6%	5%
100%	1	2/3	1/2	2/5	1/3	1/4	1/5	1/6	1/8	1/10	1/12	▨	▨
67%		1	2/3	3/5	1/2	1/3	3/10	1/4	1/5	1/6	1/10	▨	1/12
60%		1	▨	2/3	3/5	2/5	1/3	3/10	1/4	1/5	1/8	1/10	▨
50%			1	▨	2/3	1/2	2/5	1/3	3/10	1/5	1/6	1/8	1/10
40%				1	▨	3/5	1/2	2/5	1/3	1/4	1/5	1/6	▨
33%					1	2/3	3/5	1/2	2/5	1/3	1/4	1/5	1/8
30%						▨	2/3	3/5	2/5	1/3	3/10	▨	1/6
25%						1	▨	2/3	1/2	2/5	1/3	1/4	1/5
20%							1	▨	2/3	1/2	2/5	3/10	1/4
16%								1	▨	2/3	1/2	2/5	1/3
13%									1	▨	3/5	1/2	2/5
10%										1	▨	3/5	1/2
8%											1	▨	2/3

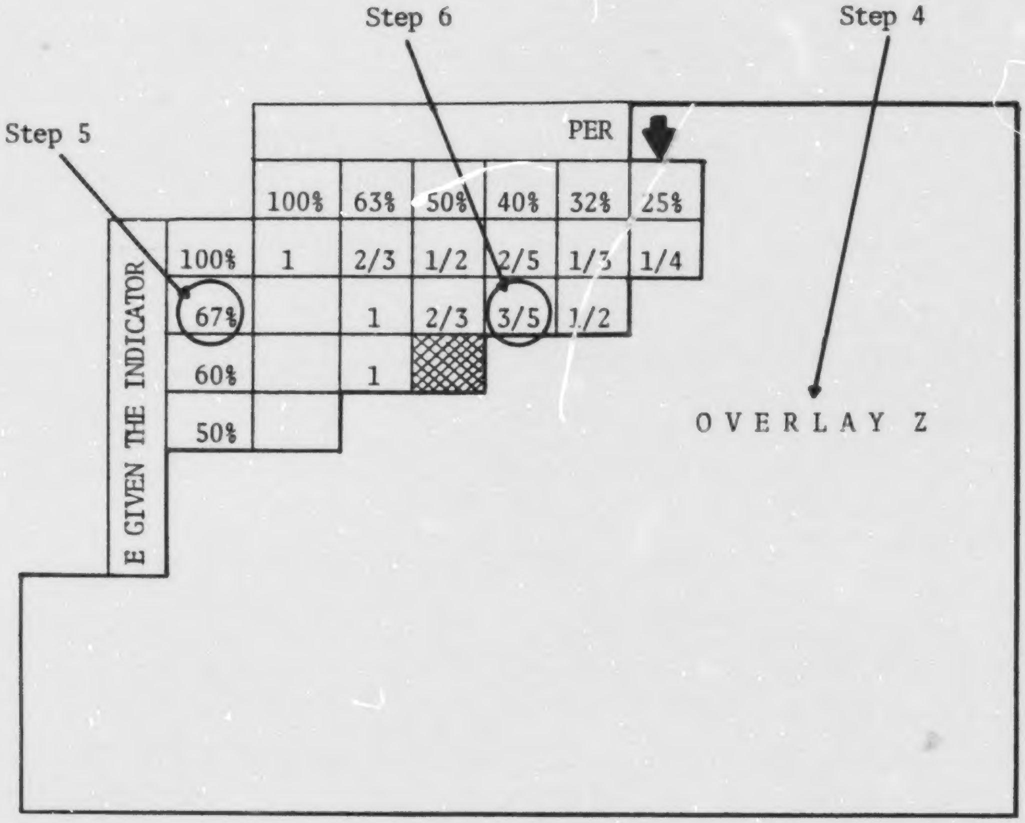
The fractions on this chart are used to determine how many indicators should be scored in each classroom sampled, depending on the percentage of classrooms to be sampled (at left).

Below and on the following pages, you will find the steps which should be followed in using the Sampling Chart, together with an example provided to illustrate each step.

Steps in Using the Sampling Chart	Example
1. Determine the total pupil population and subpopulations, if appropriate. If subpopulations *are* involved, these steps should be followed for each subpopulation.	1. The total population is 430 sixth-graders (in 14 classes with an average of 30 pupils each). In this case, no subpopulations are involved.
2. Determine the minimum percentage for sampling, using Table 1 on page S-2.	2. The minimum percentage for sampling 430 pupils is 25%.
3. Estimate the differences *among* classrooms and select the appropriate overlay for use with the Sampling Chart.	3. The 14 sixth-grade classes are from three elementary schools in Abington Township. Since (a) the three schools are at different stages in implementing the new Mathematics program being assessed, and (b) teaching methods vary considerably in the three schools, school district personnel consider the differences *among* classrooooms *greater* than the differences *within* a typical classroom. Therefore, Overlay Z has been chosen for use with the Sampling Chart.

Steps in Using the Sampling Chart	Example
4. Place the overlay selected on the Sampling Chart with the arrow on the overlay pointing to the minimum percentage for sampling. Any of the percentages in the left-hand column and the fractions exposed by the overlay can be used in making your decisions on total sample size.	4. Overlay Z should be placed on the Sampling Chart with the arrow pointing at 25% in the top row. Any of the percentages and fractions exposed by Overlay Z can be used in making decisions on total sample size. (See the illustration on page S-12.)
5. Decide which of the percentages in the left-hand column on the Sampling Chart will be the percentage of total classes involved to be given the PPNA indicator.	5. It was decided that 67% (the second percentage in the left-hand column) or nine of the 14 classes involved will be given the PPNA indicator. (See the illustration on page S-12.)
6. Any of the fractions exposed by the overlay (Step 4) across from the percentage of classes involved (Step 5) can be used to determine the number of indicators to be scored in each class sampled. This fraction may, in turn, increase the percentage of the total population to be sampled from the minimum percentage originally determined from Table 1 (Step 2).	6. The fractions exposed on the Sampling Chart for 67% of the classes are 1, 2/3, 3/5, and 1/2. In this case, it was decided to score 3/5 of the indicators from each class. Choosing 3/5 means that the percentage of the total population to be sampled will be 40%, rather than the minimum 25% originally determined from Table 1 (Step 2). (See the illustration on page S-12.)

ILLUSTRATION OF STEPS 4, 5, AND 6


Step 6
Step 4
Step 5
PER
E GIVEN THE INDICATOR
OVERLAY Z

	100%	63%	50%	40%	32%	25%
100%	1	2/3	1/2	2/5	1/3	1/4
67%		1	2/3	3/5	1/2	
60%		1	▨			
50%						

Now determine the total sample for the example on pages S-10 and S-11, step-by-step, using the figures and percentages supplied:

Step 1: There are 430 pupils in 14 classes (30 pupils per class).

Step 2: The minimum percentage for sampling is 25%.

Step 3: Overlay Z was chosen.

Step 4: Overlay Z was placed on the Sampling Chart with the arrow pointing at 25% in the top row.

Step 5: The percentage of the 14 classes to be given the indicator is 67% or 9 classes.

Step 6: In each class (assuming 30 pupils per class), 3/5 of the indicators will be scored (18 indicators from each class).

18 indicators x 9 classes = 162 pupils in the total sample

In summary, the steps in sampling are:

1. Determining the population involved as well as any appropriate subpopulations. (If subpopulations are involved, the following steps should be repeated for each subpopulation.)
2. Determining the minimum percentage needed for sampling.
3. Estimating the differences *among* classrooms and selecting the appropriate overlay.
4. Placing the overlay selected on the Sampling Chart.
5. Deciding on the percentage of classrooms to be sampled.
6. Deciding on the fraction to use in determining how many indicators will be scored for each class sampled. (This decision, in turn, may increase the percentage of the total population being sampled.)

An exercise is provided on the following page for use in practicing the steps outlined above.

EXERCISE 1

USING THE SAMPLING CHART

Please fill in the blanks in the following paragraphs, then check your answers against the answers provided on page S-17.

The Roxborough Township School District's PPNA project is designed to assess the attitudes of the pupils involved toward a new Mathematics program. This involves 1,230 pupils from 41 sixth, seventh, and eighth grade classes (averaging 30 pupils per class). It would also be desirable to determine possible differences in attitude among pupils in the three grades. Therefore, the total population should be broken into the following three subpopulations: 540 sixth graders (18 classes), 450 seventh graders (15 classes), and 240 eighth graders (8 classes). District personnel need to draw a sample for each grade which will adequately represent the opinions of the total population in each grade.

The pupils involved come from various areas within the township which represent a fairly broad range of socio-economic levels (or groups), and they exhibit differing intellectual and motivational characteristics. Within-group pupil variations are greater than pupil variations from one group to another; in any event, the pupils are distributed randomly among the classrooms so that each class represents a cross-section of the township.

(A) Sixth graders: 540 pupils (in 18 classes)

According to Table 1 on page S-2, the minimum percentage for sampling is (a)__________%. The sixth grade classes do not vary in any discernible way. Since district personnel only expect "negligible" differences *among* the classes, they decide to use Overlay (b)_____ with the Sampling Chart. They then decide to give the PPNA indicator to 50% of the 18 sixth grade classes. The smallest fraction which can be used to determine how many indicators in each sampled class should be scored is (c)_________, according to the Sampling Chart. Based on answers a, b, and c, the minimum sample size calculated is (d)_________ pupils.

Before continuing, check your answers against those on page S-17.

(B) Seventh graders: 450 pupils (in 15 classes)

According to Table 1 on page S-2, the minimum percentage for sampling is (e)_________%. Since the differences *among* these classes are also expected to be (f)______________, it is decided to use Overlay X with the Sampling Chart. They then decide to give the PPNA indicator to 60% of the 15 seventh grade classes. The smallest fraction which can be used to determine how many indicators in each class sampled should be scored is (g)_________, according to the Sampling Chart. Based on answers e, f, and g, the minimum sample size calculated is (h)_________ pupils.

(C) Eighth graders: 240 pupils (in 8 classes)

According to Table 1 on page S-2, the minimum percentage for sampling is (i)_________%. Although the differences *among* these classes are not significant, one of the teachers is considered to have excellent rapport with her pupils, and several other teachers are having difficulty with the new program. Since it is expected that these secondary variables will lead to "moderate" differences *among* the classes, district personnel decide to use Overlay (j)_____ with the Sampling Chart. They then decide to give the PPNA indicator to 100% of the 8 eighth grade classes. The smallest fraction which can be used to determine how many indicators in each class sampled should be scored is (k)_________, according to the Sampling Chart. Based on answers i, j, and k, the minimum sample size calculated is (l)_________ pupils.

(D) Totalling the samples for the three grades (answers d, h, and l) gives us a total sample of (m)_________ pupils for a total population of 1,230.

ANSWERS TO EXERCISE 1

(A) (a) 20%.
(b) Overlay X. See page S-6 for explanation.
(c) 2/5. See Sampling Chart on page S-9.
(d) 108 pupils.

Explanation: 50% of 18 classes = 9 classes
2/5 of each class (30 pupils each) = 12 pupils
12 pupils x 9 classes = 108 pupils

If any of your answers were not correct, review the step-by-step example on pages S-10 and S-11 before returning to page S-15 to continue Exercise 1.

(B) (e) 20%.
(f) Negligible.
(g) 1/3. See Sampling Chart.
(h) 90 pupils.

Explanation: 60% of 15 classes = 9 classes
1/3 of each class (30 pupils each) = 10 pupils
10 pupils x 9 classes = 90 pupils

(C) (i) 32%.
(j) Overlay Y. See page S-6 for explanation.
(k) 1/3. See Sampling Chart.
(l) 80 pupils.

Explanation: 100% of 8 classes = 8 classes
1/3 of each class (30 pupils each) = 10 pupils
10 pupils x 8 classes = 80 pupils

(D) (m) 278 pupils.

Total sample: 108 + 90 + 80 = 278 pupils

When you have completed Exercise 1 accurately, you should be ready to determine your own sample size. Please turn to Information Sheet 1 on the following page.

INFORMATION SHEET 1

SAMPLE SIZE

Use this information sheet to record information and decisions related to total sample size. (If any subpopulations are involved in your project, this page should be reproduced and appropriate information supplied for each subpopulation.)

1. Total pupil population: ______________.

2. Minimum percentage for sampling: _________.

3. The differences *among* classrooms are expected to be:

    ____ Negligible; therefore, Overlay X will be used.

    ____ Moderate; therefore, Overlay Y will be used.

    ____ Great; therefore, Overlay Z will be used.

4. After placing the selected overlay on the Sampling Chart, it was decided to give the PPNA indicator to _________% of the classes involved.

5. On the basis of Step 4, it was decided that the fraction _________ would be used to determine how many indicators in each class sampled would be scored. (If you selected 1 rather than a fraction, *all* of the indicators in the classes sampled should be scored.)

Section II of this Supplement provides guidelines for use in drawing your final sample.

If you have decided to score all of the indicators in the classes sampled, you will not need to refer to Section II.

If you have decided not to score all of the indicators in the classes sampled, refer to Section II after the completed indicators have been collected for scoring and processing.

SECTION II

DRAWING THE FINAL SAMPLE

As you start reading this section, you should have all of the completed indicators from the classes sampled. This section describes sampling procedures designed to help you draw a final sample before processing your PPNA indicator data. These sampling procedures were developed expressly for this package. The instructions should be followed carefully to achieve satisfactory results.

Tables 2 and 3 are provided to facilitate the actual drawing of an appropriate sample of the indicators collected for processing. It is suggested that you familiarize yourself with these tables before reading the instructions on drawing a final sample.

TABLE 2

SELECTION NUMBERS BY FRACTION TO BE SAMPLED

	Fraction of Each Class Sampled	Selection Numbers	Explanation
____	2/3	2, 4, 6, 7, 8, 10, 12	Even numbers & 7
____	3/5	2, 3, 4, 5, 6, 7	Numbers 2 thru 7
____	1/2	2, 4, 6, 8, 10, 12	Even numbers
____	2/5	2, 3, 4, 5, 6	Numbers 2 thru 6
____	1/3	3, 6, 9, 12	Multiples of 3
____	3/10	6, 7	---
____	1/4	4, 8, 12	Multiples of 4
____	1/5	5, 10	Multiples of 5
____	1/6	6, 12	Multiples of 6
____	1/8	8	---
____	1/10	9	---
____	1/12	10	---

TABLE 3

SAMPLING TABLE

CODE NOS.	SELECTION NUMBERS FOR DRAWING RANDOM SAMPLES						CODE NOS.
	I	II	III	IV	V	VI	
1	7	8	5	10	3	6	1
2	10	5	5	7	6	5	2
3	10	5	11	5	6	7	3
4	7	5	6	4	4	6	4
5	6	11	9	7	2	7	5
6	7	7	8	7	9	6	6
7	7	4	8	10	11	12	7
8	5	6	4	6	7	7	8
9	3	6	9	8	5	7	9
10	4	2	9	9	8	10	10
11	5	6	8	6	7	11	11
12	9	7	6	5	8	10	12
13	5	9	4	8	6	4	13
14	12	7	6	8	8	4	14
15	8	3	7	11	5	8	15
16	8	10	10	9	7	9	16
17	11	7	10	5	4	5	17
18	6	10	7	4	12	5	18
19	8	9	5	7	5	2	19
20	9	12	7	2	10	9	20
21	9	9	3	12	10	3	21
22	4	4	12	6	9	9	22
23	2	8	2	3	9	8	23
24	6	8	7	9	7	8	24
25	11	7	5	8	5	8	25
26	6	6	6	3	7	4	26
27	7	8	10	9	9	5	27
28	9	7	8	5	7	8	28
29	5	11	4	11	6	6	29
30	6	9	3	8	8	7	30
31	8	5	7	7	10	9	31
32	7	8	7	6	3	6	32
33	8	6	9	6	8	11	33
34	10	3	11	10	6	3	34
35	3	10	6	7	11	7	35
36	4	4	8	4	4	10	36
37	8	10	8	12	4	6	37
38	8	7	7	9	12	5	38
39	4	8	7	5	8	3	39
40	7	4	8	8	5	6	40
41	7	9	4	8	9	11	41
42	10	7	8	10	5	7	42
43	6	9	9	6	7	4	43
44	6	10	5	6	9	6	44
45	3	6	10	11	6	9	45
46	8	5	6	7	7	7	46
47	9	2	3	7	4	10	47
48	11	12	11	4	2	8	48
49	5	5	6	3	12	8	49
50	9	9	5	5	7	7	50

The three columns in Table 2 on page S-19 are explained below:

The *Fraction of Each Class Sampled* column lists the various fractions which can be used to determine how many indicators in each class sampled should be scored. This fraction was selected when Section I of this Supplement was completed. (See Information Sheet 1 on page S-18.) Place an "X" next to that fraction on Table 2.

The second column, *Selection Numbers*, lists sets of numbers to be used in drawing samples based on each of the fractions listed in the first column. (The use of these numbers is explained in the section on procedures for using Tables 2 and 3.)

The last column, *Explanation*, provides the general rules followed in selecting the numbers to be used with each fraction.

For example, if one-third (1/3) of the indicators in each class are to be scored, the selection numbers are multiples of three (i.e., 3, 6, 9, and 12).

Table 3 on page S-20 contains two kinds of numbers: (1) the code numbers on both sides of Table 3 (1-50) correspond to the coded pupil indicators from each class; (2) Columns I-VI provide lists of randomized numbers to use in selecting indicators which correspond to the *selection numbers* determined from Table 2.

The procedures for using Tables 2 and 3 are outlined and illustrated below:

1. Have the indicators assembled by classroom. Mix the indicators so that they are not in order by pupils' names or seating arrangements. Code numbers should be assigned to each indicator. For instance, if there are 33 pupils in a given class, numbers from 1 to 33 can be assigned to the indicators. Do this for each participating class.

2. Refer to Table 2. Put a check mark (✓) next to the fraction to be used in determining how many indicators are to be scored from each class sampled. For example, if 1/2 is the fraction selected, put a check mark (✓) next to it; note that the selection numbers for this fraction are 2, 4, 6, 8, 10 and 12. These selection numbers will be used to determine from Table 3 which pupil indicators should be scored.

3. Now take one die and throw it to decide which column in Table 3 (I-VI) to use. For example, if you get a 3 on the die, start with Column III.

4. Look down the column selected and pick out all of the selection numbers determined in Step 2. To continue with our illustration--look down Column III, noting all even numbers (i.e., 2, 4, 6, 8, 10, and 12) up to the 33rd code number (because there are only 33 pupils in this particular class). Doing this, you will find the following even numbers: 6, 8, 8, 4, 8, 6, 4, 6, 10, 10, 12, 2, 6, 10, 8, and 4.

5. Look across Table 3 from the selection numbers listed in the column selected to the nearest side column showing the corresponding code numbers. For our example, the code numbers which correspond to the selection numbers identified in Step 4 are: 4, 6, 7, 8, 11, 12, 13, 14, 16, 17, 22, 23, 26, 27, 28, and 29. These are the

code numbers of the indicators which would be processed from this class.

6. Repeat Steps 3 to 5 for each classroom sampled.

7. If you are sampling subpopulations for which different fractions are being used, repeat Steps 2 to 6 for each subpopulation.

EXERCISE 2

Answer the following questions to make sure that you understand how Tables 2 and 3 should be used.

1. Which table lists selection numbers?

   Answer: ______________________

2. Find the selection numbers for the fraction 3/5.

   Answer: ______________________

3. For which fraction are the selection numbers 3, 6, 9, 12 used?

   Answer: ______________________

4. If you throw a 4 on the die, which column will you use in Table 3?

   Answer: ______________________

5. Given coded indicators 1-28, draw, 1/6 of them as a sample using Column I of Table 3.

   Answer: ______________________

Check your answers against those supplied on the following page.

ANSWERS TO EXERCISE 2

1. Table 2.
2. 2, 3, 4, 5, 6, and 7.
3. 1/3.
4. IV.
5. 5, 14, 18, 24, and 26. (Using selection numbers 6 and 12 for 1/6.)

If any of your answers were incorrect, review pages S-21 to S-23 before continuing.

INFORMATION SHEET 2

FINAL SAMPLE

Use this information sheet to record information related to your decision on drawing a final sample. (If any subpopulations are involved in your project, this page should be reproduced and appropriate information supplied on each subpopulation.)

1. The fraction to be used in determining how many indicators in each class sampled should be scored is_________.

   This fraction was selected when Section I of this Supplement was completed.)

2. According to Table 2, the selection numbers for the fraction selected are:____.

Repeat the following steps for each class sampled:

3. Throw one die to select a number between 1 and 6.
4. Find the column number (in roman numerals) in Table 3 which corresponds to the number selected in Step 3. Refer to that column (Column _____).
5. Read down the column chosen in Step 4 and find all of the selection numbers identified in Step 2; then, note down the code numbers (in the nearest side column) which correspond to those selection numbers. The code numbers are:____.
6. The indicators identified by code number in Step 5 make up the final sample of indicators to be scored for each class.

After you have completed this information sheet, you should have completed the task of deciding which indicators in each class sampled will be scored. Give this information to the Project Manager.